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THE Gentleman's Diary, OR THE MATHEMATICAL REPOSITORY:

An ALMANACK

For the YEAR of our LORD 1742.

Being the Second after BISSEXTILE,
or LEAP-YEAR:

Containing many uſeful and entertaining Particulars, peculiarly adapted to the ingenious Gentlemen engaged in the Study and Practice of the

MATHEMATICKS.

The ſecond *Almanack* ever publiſhed of this Kind.

——— Quâ causâ argentea Phœbe
Paſſibus haud æquis graditur; cur ſubdita nulli
Hactenus Aſtronomo numerorum fræna recuſat:
Cur remeant Nodi, curque Auges progrediuntur.
——— Quantis refluum vaga Cynthia pontum
Viribus impellit; dum fractis fluctibus ulvam
Deſerit, ac Nautis ſuſpectas nudat arenas,
Alternis vicibus ſuprema ad littora pulſans.

LONDON:
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STATIONERS. 1742.

PREFACE.

THE preſent Age abounds not only with Men of Learning and Ingenuity, but alſo with Criticks: To the candid and impartial Judgment of the one, and to the Cenſure of the other, we venture to commit this our ſecond annual Performance. And tho' Silence in ſuch an Age as this, might be look'd upon as an Argument of Wiſdom and Modeſty; yet, we truſt, it will more than plead our Excuſe, when we readily acknowledge our double View in this Undertaking, even the improving our own Minds, by the Correſpondence we may hereby ſettle, and the Advantage we hope to receive from Gentlemen of Leiſure and Ingenuity; as well as communicate the Fruits of their, and our own Enquiries to the Publick. And we take this Opportunity to pay our publick Thanks to our many diſtant and unknown Friends, for the Materials they have ſent us, the farther Promiſes they have made, and the Encouragement they have given us beyond our Expectation. We repeat our former promiſe of endeavouring to make this Work as generally uſeful as poſſible to all. To this end, our deſign laſt Year, was to have fill'd each Page in the Kalendar with two Months, but as our Printer could not compoſe ſo cloſe, we obſerve there is ſome ſpare room in thoſe Pages. As this gives us an Opportunity, and a great Number of Perſons expect it from an Almanack; ſo we beg leave of our more judicious Friends, who poſſibly have no great opinion of *Judicial Aſtrology*, to gratify the Humours of others, by inſerting the Moon's Signs, and Prognoſtications reſpecting the Weather, in which we have an equal Chance with the reſt of our *Brethren* to be in the right: And the ſuperior Knowledge, and good Senſe of learned Friends, we truſt, will inſpire them with ſo much good Humour, as to paſs by this means of filling up our Paper, as favourably as they would ſo much *Blank*.

In confidence of which Favour, we now proceed to our annual Hiſtory, which we propos'd in our laſt, of the ſeveral ingenious Inventors, or Improvers of uſeful and valuable Arts and Sciences, to whoſe Diligence and Induſtry the preſent Age muſt needs allow themſelves Debtors: and hope it will not be unacceptable, if we begin to particularize upon the Invention of Letters; or, the Art of Writing; both upon account of its Antiquity, and its immediate uſefulneſs in handing down to Poſterity the Labours and Improvements of former Ages; and alſo, as 'tis the Key to all the other Arts.

This famous Art, ſome are of Opinion, was firſt invented by the *Aſſyrians* in the firſt Ages; tho' *Gellius* ſuppoſes that they were firſt invented by *Mercury* in *Ægypt*. The *Greeks* aſcribe this Invention to *Cadmus*, tho' it is certain, that there was in *Ægypt* (or elſewhere) long before his Time, nay, even before the Time of *Moſes* or *Job*, ſome attentive Genius, whoſe Name has not the Happineſs to be handed down by Hiſtory, who firſt invented this uſeful Art —— Hieroglyphicks, and Symbolical ways of Writing, appear to have been uſed by the *Ægyptians*, before they had got the Art of Letters; who, by Figures, or Statues engrav'd on Stone, pointed out the peculiar Wants, and common Neceſſities of their own Country, and proclaim'd to the People the Regulations neceſſary for the publick Safety, chiefly occaſion'd by the Inundation of their River *Nile*, &c. Theſe Symbols alſo ſerved to direct them, when to begin their Sowing, Reaping, &c. And all this under the Conduct and Regulation of their Prieſts, by which Circumſtance they became connected with *Religion* and *Aſtronomy*; and were for a long time preſerv'd in their *Schools* and *Worſhip*, till the Conſequence prov'd the Riſe of the groſſeſt Idolatry; and, the Multiplicity of Figures, or the ſame Figures under ſuch a vaſt Number of different Diſguiſes, made them loſe their true original Meaning, and came in Time to be regarded and worſhip'd as ſo many Deities. Yea, 'tis more than probable, that ſuch a Multitude of Abſurdities and Inconveniences, ariſing from the Abuſe of this Symbolical way of Writing, might give Occaſion to the aboveſaid unknown happy Genius to invent ſome of the Letters, which ſerved to expreſs or denote ſo many particular Sounds; and to connect theſe into Syllables and Words, anſwering to the Language then in Uſe.—— This ſimple, yet fruitful Invention, made a ſpeedy Progreſs; paſſing from the *Aſſyrians* to the *Jews*, thence to the *Phœnicians*, and by them imparted to the *Greeks* by *Cadmus*. The Number of Letters aſcrib'd to him are ſixteen, to which *Palamedes* in the Time of the *Trojan* War added four more,

under

under theſe Characters Θ Ξ Φ X. And after him, *Sim* *nides Mellicus* four others (viz.) Z H Υ Ω. The Force all which are expreſs'd in the Latin Alphabet: Tho' *Ariſtot* is of Opinion, that there were eighteen Letters in th Greek Alphabet from the beginning (viz.) A B Γ Δ E Z I Λ M N O Π P Σ T Υ Φ; and that the other two, Θ and were added by *Epicharmus*, and not by *Palamedes*. *Anticl* *des* writes, that *Menon* an *Egyptian*, was the firſt Invento of Letters, fifteen Years before *Phoroneus* the moſt ancien King of Greece; which he endeavours to prove by ancie Records and Monuments: But *Epigenes*, who ſeems to be authentic as any of the ancient Writers, ſays, that amon the *Babylonians*, there were found *Ephemerides*, written Bricks and Tyles, containing celeſtial Obſervations for 72 Years. *Beronus* and *Critodemus* report the ſame for 480 Yea Upon the whole, it appears that the Invention of Letters very ancient; nor is the Name of the firſt Inventor know for, after all the Reſearches we are able to make into th very remoteſt Hiſtory and Antiquity, there will ſtill rema ſomething behind, undiſcovered; however, as it has be the Care and Study of the Ingenious in all Ages, to preſerv cultivate, and improve ſo valuable and uſeful an Art, we ha the Happineſs to enjoy it in a greater degree of Perfectio than any one of the preceding Ages: And that ſo uſef and commendable an Art may never be miſuſed, but ways uſed with a generous View and Deſign, to promo the Glory of God, and the Good of Mankind in gener is the moſt hearty Deſire, and earneſt Endeavour of

The AUTHORS.

Nottingham,
May 18, 1741.

ADVERTISEMENT.

ALL Perſons who are pleaſed to be CONTRIBUTORS, by anſw ing the ÆNIGMA's, QUESTIONS, &c. in t DIARY; or by ſending new Ænigma's, Queſtions, Parado or other Subjects fitting for this WORK, are deſired to ſend the and their Solutions along with them, before the firſt Day of *May* 17 directed for the Authors of the Gentleman's Diary, to be left with *JOHN FULLER* at the *Bible* and *Dove* in *Creed-Lane*, near *Paul's*, *London*: Or (if more convenient for Poſtage, &c.) to be with Mr. *Thomas Peat*, Writing-Maſter, and Teacher of the Ma maticks in *Nottingham*. (Poſt paid.)

A TABLE of all the Kings and Queens of *England* ſince the Conqueſt.

The Year of the Birth of each King and Queen; alſo the Year, Month, and Day, whereon they began to Reign: beginning the Year the firſt Day of January, 1742.	The Length of each Reign.	The Years expired ſince each Reign began and ended.

Names.	Born.	Began to Reign.			Y.	M.	D.	Beg	End
William Conq:	1027	1066	October	14	20	10	26	676	655
William Rufus	1057	1087	Septem.	9	12	10	24	655	642
Henry I.	1058	1100	Auguſt	2	35	4	0	642	599
Stephen	1105	1135	Decem.	1	18	10	24	599	588
Henry II.	1134	1154	October	25	34	8	11	588	553
Richard I.	1156	1189	July	6	9	9	0	553	543
John	1166	1199	April	6	17	6	13	543	526
Henry III.	1207	1216	October	19	56	1	0	526	470
Edward I.	1239	1272	Novem.	16	34	7	21	470	435
Edward II.	1284	1307	July	7	19	6	13	435	415
Edward III.	1312	1327	January	20	50	5	1	415	365
Richard II.	1366	1377	June	21	22	3	8	365	343
Henry IV.	1367	1399	Septem.	29	13	5	21	343	329
Henry V.	1389	1413	March	20	9	5	11	329	318
Henry VI.	1421	1422	Auguſt	31	38	6	4	318	281
Edward IV.	1442	1461	March	4	22	1	5	281	259
Edward V.	1471	1483	April	9	0	2	13	259	259
Richard III.	1443	1483	June	22	2	2	0	259	257
Henry VII.	1457	1485	Auguſt	22	23	8	0	257	233
Henry VIII.	1492	1509	April	22	37	9	6	233	195
Edward VI.	1537	1547	January	28	6	5	8	195	189
Mary I.	1516	1553	July	6	5	4	11	189	184
Elizabeth	1533	1558	Novem.	17	44	4	7	184	139
James I.	1566	1603	March	24	22	0	3	139	117
Charles I.	1600	1625	March	27	23	10	3	117	93
Charles II.	1630	1649	January	30	36	0	7	93	57
James II.	1633	1685	February	6	4	0	7	57	53
Mary II.	1662	1689	Feb.	13	5	10	15	53	48
William III.	1650				13	0	23	48	40
Anne	1665	1702	March	8	12	4	24	40	28
George I.	1660	1714	Auguſt	1	12	10	10	28	15
George II.	1683	1727	June	11	whom God preſerve.				

A Compendious TABLE of INTEREST,

Shewing the Intereſt of any Sum of Money from a Million to a Pound; for any Number of Days, at any Rate of Intereſt.

	l.	s.	d.	q.	d.	N°.	l.	s.	d.	q.	d.
1000000—	2739	14	6	0	99	1000—	2	14	9	2	14
900000—	2465	15	0	3	29	900—	2	9	3	3	12
800000—	2191	15	7	1	59	800—	2	3	10	0	11
700000—	1917	16	1	3	89	700—	1	18	4	1	10
600000—	1643	16	8	2	19	600—	1	12	10	2	80
500000—	1369	17	3	0	49	500—	1	7	5	3	70
400000—	1095	17	9	2	79	400—	1	1	11	0	50
300000—	821	18	4	1	09	300—	0	16	5	1	40
200000—	574	18	10	3	40	200—	0	10	11	2	30
100000—	273	19	5	1	70	100—	0	5	5	3	10
90000—	246	11	6	0	32	90—	0	4	11	0	71
80000—	219	3	6	0	96	80—	0	4	4	2	41
70000—	191	15	7	1	59	70—	0	3	10	0	11
60000—	164	7	8	0	22	60—	0	3	3	1	81
50000—	136	19	8	2	85	50—	0	2	8	3	51
40000—	109	11	9	1	48	40—	0	2	2	1	21
30000—	82	3	10	0	11	30—	0	1	7	2	90
20000—	54	15	10	2	74	20—	0	1	1	0	60
10000—	27	7	11	1	37	10—	0	0	6	2	30
9000—	24	13	1	3	23	9—	0	0	5	3	67
8000—	21	18	4	1	10	8—	0	0	5	1	40
7000—	19	3	6	2	96	7—	0	0	4	2	41
6000—	16	8	9	0	82	6—	0	0	3	3	76
5000—	13	13	11	2	68	5—	0	0	3	1	15
4000—	10	19	2	0	55	4—	0	0	2	2	52
3000—	8	4	4	2	41	3—	0	0	1	3	89
2000—	5	9	7	0	27	2—	0	0	1	1	26
1000—	2	14	9	2	14	1—	0	0	0	2	63

RULE.

Multiply the Sum by the Number of Days; and that Product by th Rate per Cent. Then cut off the two laſt Figures to the right Hand, and the reſt you muſt find in the Table.

Example, What is the Intereſt of 100 l. for 365 Days at 5 per Cent? 365 N°. of Days Then againſt 1000 in the Table

Multiply by 100 Sum
36500
Multiply by 5 Rate p. Ct.
1825|00

ſtands l. 2 14 9 2 14
agſt. 800—2 3 10 0 11
agſt. 20—0 1 1 0 60
agſt. 5 is 0 0 3 1 15
5 0 0 0 00 An

JANUARY hath xxxi Days.

Firſt Quarter 2. Day at 11 at Night
Full Moon 9 Day at Midnight.
Laſt Quarter 17 Day at 8 at Night.
New Moon 25 Day at Noon.

M D	Sun Riſes.	Sun Sets.
6	7 55	4 5
12	7 46	4 16
18	7 37	4 23
24	7 26	4 34
31	7 14	4 46

1	Circum. or New Years Day	head	11 Sets 4	4 A 53
2	Days increas'd 30 minutes	face	12 25	5 42
C	2ᵈ Sunday after Chriſtmas	neck	Morn.	6 31
4	*Mild Weather*	throat	1 46	7 22
5	Day 8 hours and 7 min. long	ſhould.	3 10	8 16
6	Epiphany, or Twelfth-Day	arms	4 43	9 13
7	*for the Seaſon.* N. 15 h. 52 m	hands	5 52	10 12
8	**Notting. Epip. Fair** alway	breaſt	7 0	11 12
9	the 1ſt Frid. after the 2d of Jan	ſtom.	☽ Riſe	12 4
C	1ſt Sunday after Epiphany	heart	4 A 43	Morn.
11	*Expect ſome Show. abt. this Time*	back	6 1	1 1
12	Day 8 hours 32 minutes long	bowels	7 17	1 52
13	Hillary. **Marriage comes in**	and	8 27	2 38
14	Ox. Hil and Cam. Lent. T. beg	belly	9 34	3 21
15	Days increas'd 1 h. and 2 min	reins	10 44	4 1
16	Fair and froſt. N. 15 h. 20 m. l.	loyns	11 52	4 40
C	2ᵈ Sunday after Epiphany	ſecret	Morn.	5 19
18	Day 8 hours 46 minutes long	and	1 0	6 3
19	Days increas'd 1 h. and 12 m.	bladd.	2 8	6 46
20	P. of WALES b. Oct. H. 1 R	thighs	3 17	7 32
21	**Agues.** Night 15 h. long.	knees	4 27	8 23
22	*Rough ſtormy Weather*	hams	5 31	9 15
23	Hillary Term begins	legs	6 29	10 12
C	3ᵈ Sunday after Epiphany	legs	7 15	11 9
25	St. PAUL's Converſion	ankles	☽ Sets	After 5.
26	Day 9 hours. 8 min. long	feet	5 54	1 1
27	Quind. Hil. 2 Return	and	7 20	1 52
28	*Expect cold Storms of Rain*	toes	8 44	2 44
29	*or Snow, now-abouts*	head	10 7	3 34
30	K. Charles I. Martyrd. 1648-9	face	11 31	4 43
C	4ᵗʰ Sunday after Epiphany	neck	12 54	5 15

M D	Saturn Riſes.	Jupiter South.	Mars Riſes.	Venus Sets.	Mercu. Riſes.	Watch too faſt.	Day Breaks.	Twil. Ends
6	6 A 10	0 M 56	7 M 54	3 N 33	7 M 10	10′ 46″	5ʰ 48′	6ʰ 12′
12	5 41	0 27	7 43	3 43	7 20	12 30	5 41	6 19
18	5 14	11 A 54	7 31	8 54	7 27	13 45	5 34	6 26
24	4 47	11 27	7 18	9 5	7 29	14 31	5 25	6 3[illegible]
31	4 17	10 56	7 3	9 12	Sets.	14 43	5 14	6 45

FEBRUARY hath XXVIII Days.

Firſt Quarter 1 Day at 7 Morning
Full Moon 8 Day at 1 Afternoon
Laſt Quarter 16 Day at 4 Afternoon
New Moon 23 Day at Midnight

M D	Sun Riſes.		Sun Sets.	
6	7	2	4	58
12	6	50	5	10
18	6	39	5	21
24	6	27	5	33
28	6	19	5	41

M D	Sundays Holy Days, remarkable Days, Terms, length and incr. of D. W. &c.	[illegible]	Moon R. and S.		Moon South.	
1	Days increas'd 1 h. 58 minutes	throat	Morn.		6 A	7
2	Purification, or Candlemas Da	arms	2	16	7	4
3	Craſt. Purif. 3 Return	hands	3	17	8	0
4	Rough Winds with ſome	breaſt	4	45	8	5
5	Storms of Cold Rain or Hail	breaſt	5	47	9	5
6	Day 9 hours 53 minutes long	heart	6	27	0	5
	5th Sunday after Epiphany	back	7	0	11	41
	Days increas'd 2 h. and an half	bowels	☽ Riſ.		12	28
9	Octab. Purif. 4 Return	and	6 A	7	Morn.	
10	Fair Weather for the moſt part	belly	7	20	1	13
11	for ſome Days	reins	8	29	1	55
12	Term Ends Night 13h.40.m.l.	loyns	9	37	2	35
13	Days 10 hours 23 min. long	ſecret	10	45	3	16
	Septuageſima Valentine	and	11	54	3	58
15	**Marriage goes out**	bladd.	Morn.		4	41
16	*Cold cloudy Weather*	thighs	1	4	5	26
17	*Inclin'd to Rain abt this Time*	hips	2	14	6	14
18	Day 10 hours 42 min. long	knees	3	20	7	5
	Days increas'd 3 hours 10 min.	and	4	18	8	0
20	Night 12 hours 56 min long	hams	5	10	8	56
	Sexageſima	legs	5	49	9	52
22	Princeſs of HESSE born	ankles	6	20	10	48
23	*Wind and Rain now abouts*	feet	☽ Sets		11	42
24	St. Matthias the Apoſtle	toes	6 A	21	0 A	37
25	Day 11 hours 10 minutes long	head	7	49	1	28
26	Days increas'd 3 hours 38 min.	face	9	17	2	20
27	Night 12 hours 40 min. long	neck	10	44	3	12
	Quinquageſima or Shrov. Sun.	throat	12	10	4	7

M D	Saturn South.		Jupiter South.		Mars Riſes.		Venus Sets.		Mercu. Sets.		Watch too faſt.		Day Breaks.		Twil. Ends.	
6	11 A	16	10 A	28	6 M	49	9 A	16	5 A	22	14	33	5	4	6	50
12	10	52	10	3	6	37	9	18	6	10	13	51	4	53	7	7
18	10	28	9	38	6	24	9	15	6	50	12	48	4	43	7	17
24	10	4	9	14	6	10	9	4	7	23	11	26	4	39	7	30
28	9	48	8	58	6	1	8	52	7	33	10	23	4	21	7	39

MARCH hath XXXI Days	M D	Sun Riſes.	Sun Sets.
Firſt Quarter 2 Day at 3 Afternoon	6	6 6	5 54
Full Moon 10 Day at 6 Morning	12	5 55	6 5
Laſt Quarter 18 Day at 10 Morning	18	5 43	6 17
New Moon 25 Day at 9 Morning	24	5 30	6 30
	31	5 16	6 44

1	St. David	arms	Morn.	5 A 3
2	Shrove Tueſday. Chad B.	hands	1 ſets 30	6 0
3	Aſh Wedneſday 1st Day of Lent	breaſt	2 46	6 59
4	*Expect moderate fair and ſeaſon-*	breaſt	3 48	7 56
5	*able Weather the 1st part of this M.*	heart	4 35	8 52
6	Day 11 hours 40 minutes long	back	5 9	9 43
7	Quadrageſima, 1st Sund. in Lent	back	5 36	10 30
8	Days increas'd 4 hours 19 min.	bowels	5 58	11 18
9	☉ in Aries 28 m. paſt 6 at N.	belly	6 15	11 58
10	Ember Week. Equal D. and N.	reins	☽ Riſ.	12 39
11	in all the hab. parts of the Earth	and	7 A 28	Morn.
12	Day 12 hours 10 minutes long	loyns	8 41	1 19
13	Days increas'd 4 hours 38 min.	ſecret	9 50	2 2
14	2d Sunday Lent. Pr. Ed. bor	bladd.	11 0	2 43
15	*Brisk Winds with frequent*	thighs	12 9	3 28
16	*Showers of Rain about*	and	Morn.	4 15
17	*this Time*	hips	1 16	5 4
18	Day 12 hours 34 minutes, and	knees	2 17	5 58
19	Night 11 hours 26 min. long	hams	3 10	6 51
20	Days increas'd 5 h. 7 minutes	legs	3 54	7 46
21	3d Sunday in Lent	ankles	4 27	8 42
22	*Still expect Showers*	feet	4 54	9 35
23	☉ D.E 6 h. 18′ Alt. 7° 14′ A. 9° 5′	toes	5 15	10 28
24	Day 13 hours long	head	5 34	11 20
25	Annun. Vir. Mary, Lady Day	face	☽ ſets	0 A 12
26	*Winds, and ſome conſiderable*	neck	8 A 23	1 6
27	*down-fall or Rain; now*	throat	9 53	2 2
28	4th Sunday in Lent. Midlent S	arms	11 19	3 1
29	*and towards the End*	hands	12 43	4 1
30	☉ D.E. 6 h. 26′ A. 10° 5′ A. 12° 44′	ſhould.	Morn.	5 1
31	D. 13 h. 28 m. N. 10 h. 32 m. l.	breaſt	1 52	6 0

M D	Saturn South.	Jupiter South.	Mars Riſes.	Venus Sets.	Mercu. Sets.	Watch too faſt	Day Breaks.	Twil. Ends.
6	9 A 2	8 A 35	5 M 47	8 A 27	7 A 21	8′ 40″	4 8	7 52
12	9 3	8 13	5 34	7 54	6 42	6 50	3 3	8 5
18	8 40	7 50	5 20	7 14	Riſes.	4 58	3 40	8 20
24	8 17	7 29	5 6	Riſes	4 M 57	3 7	3 26	8 34
31	7 51	7 4	4 49	4 M 14	4 44	1 6	3 6	8 54

APRIL hath xxx Days.	M D	Sun Riſes.	Sun Sets.
Firſt Quarter 1 Day at 2 Morning	6	5 6	6 55
Full Moon 8 Day at 9 at Night	12	4 54	7 7
Laſt Quarter 16 Day at 11 at Night	18	4 43	7 17
New Moon 23 Day at 5 Afternoon.	24	4 33	7 27
Firſt Quarter 30 Day at Noon	30	4 23	7 [illegible]

1	All Fools Day. Cam. latter Ac.	breaſt	2 M 44	6 A 51
2	Days increas'd, and Nights	heart	3 23	7 48
3	Shortened 6 hours and 2 min.	back	3 51	8 38
C	5th Sunday in Lent	bowels	4 15	9 23
5	*Brisk Winds and Rain*	and	4 32	10 [illegible]
6	☉D.E.6h.33'A.13°22'A16°52'	belly	4 46	10 4[illegible]
7	Day 13 hours 54 min. and	reins	4 57	11 2[illegible]
8	Night 10 hours 6 min. long	loyns	☽ Riſe	Morn.
9	*About this time expect*	ſecrets	7 A 51	0 7
10	Oxf. and Camb. Terms end	and	9 0	0 49
C	6th Sunday in Lent. Palm. Sun.	bladd.	10 7	1 31
12	*frequent Showers of Rain*	thighs	11 9	2 18
13	D. inc. and N. ſhort. 6 h. 44 m.	hips	Morn.	3 5
14	*Now fair and pleaſant*	knees	0 11	4 0
15	Prince WILLIAM born	hams	1 12	4 52
16	Good Frid. our Saviour's Cruc.	legs	1 58	5 44
17	☉D.E.6h.46'A.18°8'A.23°3'	and	2 35	6 35
C	EASTER-DAY, Ch. Reſ.	ankles	3 3	7 30
19	Eaſter Monday	feet	3 35	8 24
20	Eaſter Tueſday	toes	3 47	9 15
21	*Rough Winds, and frequent Show-*	head	4 3	10 6
22	*ers of Rain, or Hail*	face	4 21	10 58
23	St George. Fav. Chance and For.	neck	☽ Sets.	11 50
24	Day 14 hours 54 min. long	throat	8 A 55	0 A 48
C	1st S. after Eaſter. St Mark Ev.	arms	10 26	1 48
26	**Marriage comes in**	ſhould.	11 40	2 49
27	☉D. E. 6 h. 56'A. 22°A. 28° 7'	breaſt	Morn.	3 52
28	Ox. and Cam. Eaſt. Term beg.	ſtom.	0 44	4 52
29	*Fair Weather at the End*	heart	1 24	5 48
30	Days in. and N. ſhort 7 h. 40 m.	back	2 3	6 40

M D	Saturn Sets.	Jupiter Sets.	Mars Riſes.	Venus Riſes.	Mercu. Riſes.	Watch too ſlow	Day Break.	Twil. End.
6	3 M 5	3 M 34	4 M 33	4 M 1	4 M 34	0' 9"	2 51	9 [illegible]
12	2 44	2 14	4 20	3 45	4 23	1 50	2 32	9 2[illegible]
18	2 22	1 54	4 6	3 28	4 14	2 52	2 12	9 4[illegible]
24	1 40	1 33	3 49	3 17	4 9	3 36	1 52	10 8
30	1 37	1 11	3 34	3 7	3 57	3 59	1 28	10 32

M A Y hath XXXI Days.

Full Moon 8 Day at 3 Afternoon
Laſt Quarter 16 Day at 9 Morn.
New Moon 23 Day at 1 Morn.
Firſt Quarter 30 Day at 1 Morn.

M D	Sun Riſes.		Sun Sets.	
6	4	14	7	46
12	4	7	7	53
18	4	0	8	0
24	3	53	8	7
31	3	51	8	9

1	St. Philip and Jacob	bowels	2 M 24	7 A 27
C	2d S. aft. Eaſt. Quind. Paſ. 1 Ret.	and	2 42	8 11
3		belly	2 57	8 52
4	*Brisk Winds and frequent Showers*	reins	3 11	9 33
5	Eaſter Term begins	loyns	3 24	10 10
6	Day 15 hours 32 minutes, and	ſecret	3 35	10 50
7	Night 8 hours 28 minutes long	and	3 49	11 33
8	☽ Eclips'd inviſible	bladd.	☽ Riſe	Morn.
C	3 S. aft. E. Tr. P. 2 R. Celeſt. El.	thighs	9 A 7	0 18
10		hips	10 16	1 5
11	☉ D.E. 7 h. 8′ A. 26° 23′ A. 34° 2′	knees	11 11	1 56
12	D. in. and N. ſhort. 8 h. 12 m	and	12 0	2 50
13	*Expect moderate fair and pleaſant*	hams	Morn.	3 45
14	*Weather about this Time*	legs	0 40	4 39
15	☉ D.E. 7h 11 A. 27° 24′ A. 35° 22′	ankles	1 10	5 28
C	4 S. aft. Eaſt. Mens. Paſc. 3 Ret.	feet	1 31	6 19
17		toes	1 51	7 9
18	Day 16 h. and N. 8 h. long	head	2 9	7 59
19	*Brisk Winds, and perhaps ſome*	face	2 23	8 46
20	*Thunder Showers*	neck	2 38	9 35
21	D. in. and N. ſhort. 8 h. 24 m.	throat	3 2	10 27
22	**Marriage goes out** ☉ Ec. inv.	arms	3 28	11 26
C	5 S. aft. Eaſt. Rog. S. Qu. P. 4 R.	ſhould.	☽ Sets	0 A 28
24	Prince GEORGE born	breaſt	10 A 24	1 32
25	Rogation Week	ſtom.	11 19	2 36
26	D. 16 h. 1 qu. N. 7 h. 3 qu. l.	heart	11 58	3 30
27	Holy Thurſ. Chriſt's Aſcenſion	and	Morn.	4 30
28	Craſt. Aſcen. 5 Return.	back	0 28	5 16
29	K. Ch. II. Birth & Ret. 1660	bowels	0 46	6 2
C	6th S. aft. E. Pr. AM. & CAR. b.	belly	1 1	6 46
31	Eaſter Term ends	reins	1 17	7 26

M D	Saturn Sets.	Jupiter Sets.	Mars Riſes.	Venus Riſes.	Mercu. Riſes.	Watch too ſlow	Day Break.	Twil. Ends.
6	1 M 14	0 M 49	3 M 19	2 M 54	3 M 49	4′ 2″	0 58	11 2
12	0 52	0 28	3 4	2 42	3 48	3 45	No	all
18	0 28	0 5	2 47	2 28	3 53	3 9	real	Twi-
24	0 4	11 N 42	2 32	2 14	Sets.	2 28	Night,	light
31	11 A 34	11 13	2 12	2 19	9 27	1 0	but	

JUNE hath xxx Days.

Full Moon 7 Day at 6 Morning
Laſt Quarter 14 Day at 4 Afternoon
New Moon 21 Day at 9 Morning
Firſt Quarter 28 Day at 5 Afternoon.

M D	Sun Riſes	Sun Sets.
6	3 48	8 12
12	3 47	8 13
18	3 50	8 10
24	3 53	8 7
30	3 57	8 3

1	⊙ D.E. 7h 19′ A. 30° 11′ A. 39° 16′	loins	1 M 30	8 A 7
2	*Briſk Winds, and Thunder Showers.*	ſecret	1 41	8 47
3	Oxford and Camb. Term ends	and	1 54	9 28
4	Days are now increaſ'd, and	blad.	2 9	10 14
5	Nights ſhortn. 8 h. and 50 m.	hips	2 30	11 0
C	Whit-Sunday, Deſcent Ho. Gh	and	2 54	11 48
7	Whit-Monday	thighs	☽ Riſe	Morn.
8	Tueſday *Fair and pleaſant*	knees	9 A 57	0 40
9	Ember Week *Weather*	hams	10 36	1 33
10	⊙ in ♋ 5 h. 29′ P. M. Lon. D.	legs	11 11	2 28
11	K. Geo. II. Inaug. St. Barnab	ankle	11 34	3 19
12	D. 16h. 26m. and N. 17 h. 34 m. l.	feet	11 52	4 11
C	Trin. S. Marriage comes in	toes	12 9	5 0
14	Cras Tr. 1 Ret. Tr. Col. Ox. El.	head	Morn.	5 48
15	K. GEORGE II. Proclaimed	and	0 25	6 37
16	Oxford Trinity Term begins	face	0 38	7 23
17	Corpus-Chriſti-Day	neck	0 56	8 13
18	Trinity Term begins	throat	1 14	9 7
19	D.E. 7h. 21′ A. 30° 13′ A. 39° 21′	arms	1 44	10 6
C	1 S. aft. Tr. Octab. Trin. 2 Ret.	ſhould.	2 23	11 6
21		breaſt	☽ Sets.	0 A 9
22	*Fair Weather for the moſt part*	ſtom.	9 A 14	1 11
23	Days decr. Night incr. 12 min.	heart	10 21	2 9
24	St. John Bapt. or Midſum. Day	back	10 42	3 2
25	St. John's College Oxon Elect.	belly	11 1	3 52
26	⊙ D.E. 7h. 17′ A. 29° 29′ A. 38° 17′	bowels	11 17	4 36
C	2 S. aft. Tr. Quind. Trin. 3 Ret.	reins	11 30	5 18
28	*Good Weather for the Harveſt*	and	11 41	5 58
29	St. Peter and St. Paul	loyns	11 56	6 37
30	Exeter College Election	ſecrets	12 11	7 19

M D	Saturn Sets.	Jupiter Sets.	Mars Riſes.	Venus Riſes.	Mercu. Sets.	Watch too faſt.	Day Breaks.	Twil. Ends.
6	11 A 8	10 A 49	1 M 59	1 M 49	9 A 44	0′ 14	No Real Night,	but all Twilight.
12	10 44	10 27	1 43	1 39	9 48	1 32		
18	10 21	10 6	1 29	1 29	9 42	2 47		
24	9 58	9 45	1 15	1 22	9 28	3 54		
30	9 35	9 23	1 2	1 14	9 2	4 50		

JULY hath XXXI Days.

	M D	Sun Riſes.	Sun Sets.
Full Moon 6 Day at 7 at Night	6	4 4	7 56
Laſt Quarte 13 Day at 10 at Night	12	4 11	7 49
New Moon 20 Day at 6 Afternoon	18	4 17	7 43
Firſt Quarter 28 Day at 11 Morn.	24	4 24	7 36
	31	4 35	7 25

1	Day 16 h. 6 m. N. 7 h. 54 m.	bladd.	Morn.	8 A 1
2	*Expect ſome Rain in a few Days*	hips	0 31	8 47
3	Ox. Act beg. 7 D. before T. ends	and	0 54	9 32
C	3 S. after Tr. Tres Trin. 4 Ret.	thighs	1 25	10 25
5		knees	2 3	11 19
6	Cambridge Commencement	and	3 0	12 5
7	Trin. Term ends. Th. Becket	hams	☽ Riſe	Morn.
8	*Still expect ſome flying Showers*	legs	9 A 33	1 6
9	⊙D.E.7h.10′A.26°55′A.34°45′	ankle	9 54	1 59
10	Oxford Term ends	feet	10 12	2 50
C	4th Sunday after Trinity	toes	10 27	3 40
12	Day ſhort. Night incr. 48 m.	head	10 41	4 29
13	*Fair, pleaſant and ſeaſonable*	face	10 58	5 15
14	*Weather for the moſt part*	neck	11 16	6 5
15	Swithin	throat	11 41	6 56
16	⊙D. E. 7 h. 4′ A. 25° 0′ A. 32° 7′	arms	12 14	7 50
17	Day 15 h. 26 m. N. 8 h. 34 m.	ſhould	Morn.	8 47
C	5th Sunday after Trinity	breaſt	0 58	9 48
19	Dog Days beg. Syrius riſ. Coſm.	ſtomac	1 59	10 50
20	Days decr. and N. incr. 1 h. 6 m.	heart	3 11	11 49
21	*Some Showers may be expected a-*	back	☽ Sets.	0 A 47
22	Magdalen *(bout this Time*	bowels	9 A 4	1 38
23	⊙D.E. 6h.58′A.22°44′A.29° 8′	and	9 22	2 26
24	Magdalen College Election	belly	9 34	3 9
C	6 S. aft. Tr. St. James Apoſtle	reins	9 48	3 55
26	Day 15 hours 4 min. and	loins	10 1	4 31
27	Nights 8 hours 56 min. long	ſecret	10 14	5 12
28	D.dec. and N. length 1 h. 26 m.	and	10 31	5 54
29	*Fair Weather to the End*	bladd.	10 52	6 39
30	⊙D.E.6h.50 A.19 47′A.25°13	hips	11 19	7 25
31	Princeſs AUGUSTA born	thighs	1 55	8 14

M D	Saturn Sets.	Jupiter Sets.	Mars Riſes.	Venus Riſes.	Mercu. Sets.	Watch too faſt	Day Breaks	Twil Ends.
6	9 A 13	9 A 1	0 M 52	1 M 9	8 A 41	5′ 31″	All	Twil.
12	8 52	8 41	0 43	1 8	8 45	5 53	0 30	11 30
18	8 28	8 19	0 34	1 7	7 29	5 54	1 8	10 52
24	8 7	7 59	0 26	1 12	Riſes.	5 34	1 36	10 24
31	7 41	7 30	0 17	1 20	3 M 39	4 43	2 0	10 0

AUGUST hath XXXI Days.	M D	Sun Rises.		Sun Sets.	
Full Moon 5 Day at 6 in the Morn.	6	4	49	7	11
Laſt Quarter 12 Day at 4 in the Morn.	12	5	0	7	0
New Moon 19 Day at 5 in the Morn.	18	5	12	6	48
First Quarter 27 Day at 5 in the Morn.	24	5	22	6	38
	31	5	38	6	22

C	7 Sunday after Trin. Lammas	knees	2 A	44	9 A	8
2	*Fine ſeaſonable Weather*	and	Morn.		10	2
3	*for the Harveſt*	hams	1	46	10	58
4	Day 14 hours 32 minutes, and	legs	2	57	11	53
5	Night 9 hours 28 min long	ankles	☽ Riſ.		12	40
6	Day ſhort. and N. inc. 2 h. 2 m.	feet	8 A	20	Morn.	
7	*Expect ſome Showers of Rain, and*	toes	8	36	1	36
C	8th Sunday after Trinity	head	8	53	2	55
9	*Claps of Thunder about this Time*	face	9	10	3	14
10	☉ D.E.6h39′A.15°42′A.19° 54′	neck	9	28	4	3
11	Day 14 h. and Night 10 h. l.	throat	9	52	4	53
12	Days dec. and N. in. 2 h. 26 m	arms	10	24	5	48
13	*Fair Weather*	ſhould.	11	1	6	45
14	*for the moſt part*	breaſt	11	53	7	44
C	9th Sunday after Trinity	and	Morn.		8	43
16	☉ D E.6h35′A.13° 59′A.17° 42′	ſtom.	0	59	9	43
17	Day 13 h. 40 m. N. 10 h. 20 m.	heart	2	15	10	42
18	Days are now decr. and Nights	back	3	34	11	31
19	lengthen'd 2 h. and 50 min.	bowels	☽ Sets.		0 A	23
20	*Rough bluſtering Winds*	belly	7 A	47	1	12
21	☉ D.E.6h.27′A.10°45′A.13°35	reins	8	0	1	53
C	10th Sunday after Trinity	and	8	13	2	33
23	*Now expect ſome Showers of*	loyns	8	28	3	15
24	St. Bartholomew Apoſtle	ſecret	8	44	3	57
25	*Rain with Claps of Thunder*	bladder	9	2	4	41
26	D. 13 h. 6 m. N. 10 h. 54 m. l.	thighs	9	28	5	26
27	Dog Days end	and	9	56	6	14
28	*Syrius* Riſes at 3 in the Morn.	hips	10	43	7	5
C	11th Sunday after Trinity	knees	11	38	7	59
30	*Fair Weather at the End*	hams	Morn.		8	53
31	D dec. and N. length. 3 h. 42 m	legs	0	42	9	46

M D	Saturn Sets.		Jupiter Sets.		Mars Riſes.		Venus Riſes.		Mercu. Riſes.		Watch too faſt.		Day Breaks.		Twil. Ends.	
6	7 A	21	7 A	17	0 M	11	1 M	31	3 M	17	3′	37″	2	23	9	37
12	Riſes.		Riſes.		0	7	1	43	3	20	2	16	2	41	9	19
18	4 M	18	4 M	15	0	2	1	58	3	42	0	38	2	59	9	1
24	4	1	4	1	11 N	57	2	17	4	21	1 ſlo.	14	3	16	8	44
31	3	42	3	44	11	54	2	36	5	13	3	34	3	34	8	20

SEPTEMBER hath xxx Days.

Full Moon 3 Day at 4 Afternoon
Laſt Quarter 10 Day at 10 Morning
New Moon 17 Day at 6 at Night
Firſt Quarter 25 Day at Midnight

M D	Sun Riſes.		Sun Sets.	
6	5	48	6	12
12	6	0	6	0
18	6	12	5	48
24	6	24	5	36
30	6	36	5	24

1	☉ D.E. 6h. 14′ A. 5° 28′ A. 6° 53′	ankles	2	1	10	41
2	LONDON burnt 1666	feet	3	24	11	33
3	*Briſk Winds, and perhaps ſome*	toes	☽ Riſe	Morn.		
4	*flying Showers about this Time*	head	7 A	5	0	23
C	12th Sunday after Trinity	face	7	22	1	15
6	Day 12 hours 24 minutes, and	neck	7	40	2	5
7	Night 11 hours and 36 min. l.	throat	8	1	2	53
8	D. now de. and N. in. 4 h. 12 m	arms	8	28	3	51
9	*A thick and cloudy Air*	and	9	5	4	47
10	*inclin'd to Rain*	ſhould.	9	51	5	46
11	☉ in ♎ 12 D. 43 m. paſt 6 m.	breaſt	10	57	6	47
C	13th Sunday after Trinity	ſtom.	12	8	7	47
13	Equ. D. and N. in the hab. World	heart	Morn.		8	42
14	Holy-Rood-Day	back	1	27	9	36
15	Ember Week	bowels	2	47	10	27
16	Day 11 hours 46 min. and	belly	4	8	11	12
17	Nights 12 h. and 20 min. long	reins	☽ Sets.		11	56
18	D. decr. and N. inc. 4 h. 50 m.	and	6 A	27	0 A	39
C	14th Sunday after Trinity	loyns	6	42	1	21
20	*Expect fair Weather abt. this Time*	ſecrets	6	57	2	3
21	St. Matthew Evangeliſt	bladd.	7	14	2	46
22	Day 11 hours 16 min. and	thighs	7	35	3	31
23	Night 12 hours 44 min. long	and	8	3	4	13
24	The Days are now decr. and the	hips	8	43	5	6
25	Nights lengthen'd 5 h. and a qr.	knees	9	32	5	59
C	15th Sunday after Trinity	hams	10	32	6	51
27	Day 11 hours, and	legs	11	44	7	45
28	Night 13 hours long	and	Morn.		8	37
29	St. Michael the Arch-Angel	ankles	1	4	9	29
30	*Winds and Rain at the End.*	feet	2	28	10	20

M D	Saturn Riſes.	Jupiter Riſes.	Mars Riſes.	Venus Riſes.	Mercu. Sets.	Watch too ſlow	Day Breaks.	Twil. Ends.
6	3 M 24	3 M 30	11 N 51	2 M 56	6 N 22	5′ 39″	3 47	8 13
12	3 5	3 16	11 48	3 15	6 12	7 44	4 1	7 59
18	2 47	3 3	11 45	3 35	6 6	9 44	4 14	7 46
24	2 30	2 46	11 42	3 54	5 58	11 37	4 27	7 33
30	2 11	2 30	11 39	4 15	5 50	13 13	4 39	7 21

OCTOBER hath xxxi Days.	M D	Sun Riſes.		Sun Sets.	
Full Moon 3 Day at 2 in the Morn.	6	6	48	5	12
Laſt Quarter 9 Day at 7 at Night	12	6	59	5	1
New Moon 17 Day at 11 in the Morn.	18	7	10	4	50
Firſt Quarter 25 Day at 11 Morning	24	7	21	4	39
	31	7	33	4	27

1	*Briſk Gales of Wind*	toes	3	53	11	10
2	Days are now decreaſ'd, and	head	5	17	12	1
C	6th Sunday after Trinity	face	☽	Riſe	Morn.	
4	Nights incr. 5 h. and 50 min.	neck	6	A 9	0	54
5	Day 10 hours 24 min. and	throat	6	32	1	47
6	Night 13 hours 36 min. long	arms	7	7	2	45
7	*Moderate Weather*	ſhould.	7	53	3	47
8	*for the Seaſon*	breaſt	8	52	4	47
9	Days now ſhortn. 6 h. and a qr	ſtom.	10	5	5	5
C	7th Sunday after Trinity	heart	11	19	6	4
11	K. Geo. II. crown'd (Oxf. and	back	Morn.		7	4
12	Cambr. Michael Terms begin	bowels	0	40	8	31
13	Day 10 hours, and	and	1	59	9	18
14	Night 14 hours long	belly	3	16	10	1
15	*Some Showers may be expected*	reins	4	28	10	43
16	*about this Time*	loyns	5	38	11	24
C	8th Sunday after Trinity	ſecrets	☽	Sets.	0	A 5
18	St. Luke Evangeliſt	and	5	A 24	0	47
19	D. ſhort. and N. length. 6h. 36m.	bladd.	5	45	1	31
20	Tres Mich. 1 Ret.	hips	6	14	2	16
21	Day 9 hours and half, and	thighs	6	50	3	6
22	N. 14h. and half long. Prs. Or. b.	knees	7	32	3	55
23	Michaelmas Term begins	and	8	23	4	49
C	9th Sunday after Trinity	hams	9	33	5	52
25	Chriſpin	legs	10	50	6	33
26	*Cold Winds and frequent Show.*	ankles	0	M 6	7	22
27	Menſ. Mich. 2 Ret.	feet	1	25	8	11
28	St. Simon and Jude Apoſtles	toes	2	50	9	1
29	D. dec. and N. inc. 7 h. 28 m.	head	4	13	9	51
30	K. Geo. II. born 1683.	face	5	36	10	41
C	10th Sunday after Trinity	neck	6	59	11	3

M D	Saturn Riſes.		Jupiter Riſes.		Mars Riſes.		Venus Riſes.		Mercu. Sets.		Watch too ſlow		Day Break.		Twil. Ends.	
6	1 M	52	2 M	13	11 N	34	4 M	34	5 N	39	14′	32″	4	51	7	9
12	1	32	1	57	11	29	4	54	5	32	15	31	5	2	6	58
18	1	11	1	41	11	24	5	14	5	25	16	4	5	12	6	48
24	12	52	1	28	11	21	5	43	5	16	16	11	5	21	6	39
31	12	26	1	3	11	14	5	57	5	4	15	41	5	30	6	28

NOVEMBER hath xxx Days

	M D	Sun Rises		Sun Sets	
Full Moon firſt Day at Noon	6	7	44	4	16
Laſt Quarter 8 Day at 3 Morning	12	7	52	4	8
New Moon 16 Day at 6 Morning	18	7	59	4	1
Firſt Quarter 24 Day at 4 Morning	24	8	4	3	56
Full Moon 30 Day at 10 at Night	30	8	8	3	52

1	All Saints. ☽ Eclips'd inviſible	throat	☽ Rise	☉ M 33
2	All Souls. *Cold and Stormy*	ſhould.	5 A 13	1 34
3	Cr. An. 3 Ret. All Souls Col. El.	arms	5 54	2 34
4	Day 8 hours and 38 min. long	breaſt	6 42	3 39
5	Gunpowder Treaſon 1605	ſtom.	7 44	4 32
6	*Moderate for the Seaſon*	heart	9 6	5 38
7	21 Sunday after Trinity	back	10 31	6 31
8	*Expect cold Winds with*	bowel	11 47	7 18
9	*Rain or Sleets of Snow*	and	Morn.	8 3
10	Days decr. and N. inc. 8. h 6 m.	belly	2 18	8 44
11	Martin Biſhop of Tours	reins	3 21	9 22
12	Cr. Mart. 4 Returns	loyns	4 25	10 1
13	Day 8 h. 1 qu. N. 15 h. 3 qu. l.	ſecrets	5 43	10 46
14	22 Sunday after Trinity	and	6 51	11 3
15	*Cold Rains or Sleets of Snow*	bladd.	8 1	11 39
16	☉ Eclipſ'd inviſible	hips	☽ Sets	0 A 12
17	*may now be expected*	thighs	4 A 40	0 55
18	Octab. Mart. 5 Returns	knees	5 8	1 48
19	Princeſs of WALES born	and	6 8	2 38
20	D. dec. and N. lengt. 8 h. 26 m.	hams	7 7	3 37
21	23 Sunday after Trinity	legs	8 20	4 16
22	*Something Warmer, but ſtill*	ankles	9 40	5 6
23	*expect ſome downfall*	feet	11 0	5 54
24	Day 7 hours and 52 min. long	toes	Morn.	6 47
25	Quind. Mart. 6 Returns	head	1 40	7 33
26	Baliol College Election	and	3 2	8 20
27	Days decreas'd 8 hours 38 min.	face	4 28	9 7
28	Adv. Sun **Marriage goes out**	neck	5 58	9 57
29	Michaelmas Term ends	throat	7 26	11 0
30	St. Andrew Apoſtle	ſhould.	8 52	0 M 2

M D	Saturn Riſes	Jupiter Riſes	Mars Riſes	Venus Riſes	Mercury Sets	Watch too ſlow	Day Break	Twil. Ends
6	11 A 58	12 M 39	10 A 56	6 M 20	4 A 41	14' 42	5 39	6 21
12	11 35	12 18	10 43	6 33	Riſes	13 13	5 46	6 14
18	11 9	11 N 48	10 32	6 46	7 M 36	11 18	5 5	6 7
24	10 45	11 28	10 12	7 4	7 21	8 56	5 53	6 4
30	10 19	11 11	9 52	7 22	7 0	6 16	5 58	6 7

DECEMBER hath XXXI Days

Laſt Quarter 7 Day at 8 at Night
New Moon 16 Day at 2 Morning
Firſt Quarter 23 Day at 5 at Night
Full Moon 30 Day at 9 Morning

M. D.	Sun Riſes.		Sun Sets.	
6	8	10	3	50
12	8	11	3	49
18	8	7	3	53
24	8	4	3	56
3	8	1	[illegible]	[illegible]

1	Day 7 Hours 42 Minutes, and	arms	☽	Ri.	1 M	1
2	Night 16 Hours 18 Min. long	breaſt	5	17	2	9
3	Days decr. and Nights incr. 8 h.	ſtomach	6	25	3	13
4	*Cold and ſtormy Weather* (45 m.	heart	7	49	4	4
C	Second Sunday in Advent	back	9	21	4	59
6	⊙ great. amplit. at Lond. 39.50	belly	10	38	5	46
7	Not^{m} 41° 28′ Prin. LOUISA born	bowels	11	56	6	29
8	The greateſt ſhort. at L. 8h 50m	reins	Morn.		7	11
9	The ſhorteſt Day at L. 7h. 35m	and	2	10	7	52
10	⊙ in ♑ 10 Minutes paſt Noon	loins	3	24	8	34
11	The ſhorteſt D. at Not. 7h 18m l.	ſecrets	4	29	9	13
C	Third Sunday in Advent	bladder	5	37	9	57
13	The great. ſhort. at N. 9h. 24m	hips	6	46	10	46
14	The differ. of incr. & decr. 34m	and	8	0	11	35
15	Ember Week	thighs	8	50	0 A	26
16	*Cold Winds with*	knees	Sets.		0	42
17	Oxf. and Cambr. Terms end	hams	4 A	58	1	14
18	*Snow or Rain*	legs	6	12	2	7
C	Fourth Sunday in Advent	ankles	7	18	2	56
20	Days increas'd 13 minutes	feet	8	36	3	43
21	St. Thomas Apoſtle	and	9	54	4	28
22	Day 7 Hours 30 Minutes and	toes	11	11	5	14
23	Night 16 Hours 10 Min. long	head	Morn.		6	1
24	*Fair and froſty*	face	1	51	6	49
25	CHRISTMAS-DAY	neck	3	22	7	38
C	1 Sund. after Chriſt. St. Steph.	throat	4	43	8	30
27	St. John the Evangeliſt.	ſhoulder	6	7	9	31
28	Innocents Day, Herod's Cruelty	arms	7	25	10	32
29		breaſt	8	3	11	3
30	Days increas'd, & Pr. Eliz. born	ſtomach	Riſes.		0 M	41
31	Nights ſhorten'd 23 Minutes	heart	4	12	1	46

[illegible]	Saturn Riſes		Jupiter Riſes		Mars Riſes		Venus Riſes		Mercury Riſes		Watch too ſlow		Day breaks		Twil. ends.	
[illegible]	9 A	52	10 A	44	9 A	38	7 M	38	6 M	13	3′	21″	6	1	5	59
12	9	30	10	21	9	21	7	52	6	16	0	11	6	1	5	59
18	8	59	9	52	8	58	8	16	6	24	2 faſt	9	6	1	5	59
24	8	31	9	25	8	37	Sets		6	40	5	29	5	58	6	[illegible]
[illegible]	8	2	9	[illegible]	8	19	4 A	0	–	8	8	20	5	[illegible]	6	[illegible]

Mr. ABRAHAM LORD ſent us the following Table of the Immerſions and Emerſions of *Jupiter*'s firſt *Satellite* for the Year 1742. from Mr. *Pound*'s Tables, reduced to apparent Time at London; but takes no Notice of the progreſſive Motion of Light, which if it be 11′ from the Sun, will make theſe *Phænomena* nearly 1 Minute later than is inſerted in the following Table.

Immerſions.				Emerſions.				Emerſions.				Emerſions.			
January.				February.				April.				June.			
D.	h.	′	″	20	10	55	54	14	13	3	58	6	5	21	49
1	18	52	56	22	4	54	53	16	7	51	35	8	8	42	1
3	13	20	15	23	23	24	3	18	2	0	54	10	4	18	11
5	7	48	1	25	17	53	21	19	20	34	46	11	22	46	29
7	2	45	55	27	12	21	39	21	14	58	54	13	17	14	46
8	20	53	42	March.				23	8	18	15	15	11	43	8
10	12	12	4	1	6	57	51	25	3	56	44	17	6	11	17
12	9	39	57	3	1	20	55	26	12	21	34	19	0	39	38
14	3	48	14	4	19	50	7	28	16	55	26	20	19	7	54
15	22	36	20	6	14	19	21	30	11	23	17	22	13	36	10
18	☍	☉	♃	8	8	48	35	May.				24	8	4	31
Emerſions.				10	3	17	50	2	5	52	3	26	2	32	52
19	14	16	43	11	21	47	8	4	0	20	44	27	21	1	15
21	18	17	4	13	16	16	12	5	17	59	31	29	15	29	33
23	2	45	17	15	10	45	24	7	13	18	4	July.			
24	21	13	55	17	5	15	24	9	7	45	54	1	9	57	59
26	15	42	25	18	23	44	38	11	2	15	21	3	4	26	21
28	10	10	22	20	18	13	30	12	20	44	17	4	22	54	49
30	4	39	27	22	12	43	15	14	15	12	35	6	17	23	20
31	23	8	5	24	7	12	36	16	9	41	7	8	11	51	48
February.				26	1	41	44	18	4	9	38	10	6	20	15
0	23	8	0	27	20	11	3	19	22	38	6	12	0	48	56
2	17	36	30	29	14	40	17	21	17	6	29	13	19	17	58
4	12	5	37	31	9	9	51	23	11	34	28	15	13	46	28
6	6	31	22	April.				25	6	3	20	17	8	15	4
8	1	3	18	2	3	38	48	27	0	31	45	19	2	43	45
9	19	36	11	3	22	9	58	28	19	0	5	20	21	12	21
11	14	4	3	5	16	36	10	30	13	28	9	Auguſt.			
13	7	29	45	7	11	6	19	June.				6	☍	☉	♃
15	2	58	45	9	5	35	20	1	7	56	35	Immerſions.			
16	12	27	54	10	0	4	40	3	2	24	55	23	10	4	9
18	15	56	58	12	19	33	41	4	20	42	35	25	4	33	13

Immerſions Auguſt.				Immerſions. September.				Immerſions. October.				Immerſions. November.			
27	23	2	17	27	19	45	2	29	16	18	56	30	12	39	3
28	17	31	20	29	14	13	45	31	10	47	8	December.			
30	12	0	26	October.				November.				2	7	6	22
September.				1	8	42	32	2	5	15	8	4	1	33	57
1	6	29	32	3	3	10	16	3	23	43	16	5	20	11	19
3	0	58	37	4	21	40	0	5	18	11	10	7	14	27	54
4	19	27	46	6	16	8	48	7	12	39	8	9	9	35	20
6	13	56	51	8	10	37	30	9	7	5	3	11	3	28	56
8	7	25	54	10	5	45	9	11	1	34	53	13	21	50	58
10	2	54	58	11	23	34	51	12	20	2	46	14	16	17	50
11	21	23	57	13	18	3	28	14	16	30	37	16	10	16	18
13	15	53	3	15	12	32	2	16	8	58	19	18	5	12	58
15	10	22	7	17	7	0	32	18	3	26	12	19	23	40	2
17	4	50	7	19	1	28	6	19	21	53	42	21	17	48	46
18	23	19	6	20	19	58	20	21	16	21	12	23	12	36	16
20	17	48	9	22	14	5	41	23	14	48	59	25	7	2	49
22	12	18	7	24	8	54	2	25	5	16	21	27	1	31	51
24	6	47	5	26	3	22	23	26	23	44	14	28	19	59	2
26	1	16	5	27	21	50	47	28	18	11	36	30	14	36	38

The Eclipſes in the Year 1742 by Mr. Abraham Donn.

There will be 4 Eclipſes this Year, two of each Luminary, but all inviſible to Great Britain. The firſt of the Moon, on the 8th of May, about 3 in the Afternoon, conſequently inviſible to us; but in the Eaſt-Indies will be three Digits dark on the Moon's South Limb. The ſecond is of the Sun, on May 22, which happening about Midnight, is alſo inviſible; but even in our Latitude farther Eaſt it will be total. The third of the Moon November 1, about half an Hour after Noon, inviſible to us alſo, but in the Eaſt-Indies will be near 9 Digit dark on the North Side. The 4th of the Sun, Nov. 16, about 6 in the Morning, inviſible to us, and all in the North. H alſo obſerves, that *Venus* is our Evening-Star till the 21ſt o March, and then becomes our Morning Star, and ſo continue till the End of the Year.

R. Ceſtrienſis deſires us to acquaint the Publick of a famou ☌ of ♄ and ♃ (according to *G. Leadbetter*) the 23d Day o Auguſt, at 20 paſt 10 at Night, in 27° 55 23″ of the Rega Sign ♌ N. Lat. 1° 7′ N. Aſc. & ♃ 0 52 N. Aſc. will b elevated above ♃ 25′. 00′, they are both Morning Stars, an under the Sun's Beams, *&c.*

Anſwers to the ÆNIGMA's in the laſt Year's DIARY.

I. HEMP.
II. The Year FORTY.
III. A TOBACCO-PIPE.
IV. A SEWING-NEEDLE.

The Propoſer's own Explanation of his Second Ænigma, *(a)* 1140, *(b)* 1340, *(c)* The Invention of Printing 1440, *(d)* Thomas Cromwel made an Earl in 1540, *(e)* and beheaded in July following. *(f)* 1740.

All the Ænigma's anſwer'd by Mr. Robert Robinſon.

May great *Vernon*'s CANVASS ſtrike proud Spain with fear, 1
And this be to Britain a ſucceſsful YEAR; 2
Let our able *Sailors* their PIPES lay aſide, 3
And humble the *Dons* as they haughtily ride;
Each do his Endeavour their *Fleets* to control,
True and juſt to his *Country* as NEEDLES to th' Pole. 4

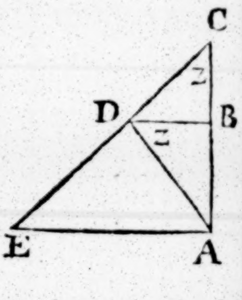
A PARADOX by Mr. *John Burdekin*, to be anſwered next Year.

As all the Inhabitants of our Globe count Latitude from the Equator; ſo let us count Longitude from one Meridian; yet I ſay, there are thirty Places of the Earth an hundred Miles diſtant one from another, Twenty-nine of which have neither Longitude nor Latitude; but, the Thirtieth, hath both the greateſt and leaſt Degree of Longitude; at which Place the Inhabitants are ſeated in a very low Valley; and yet are above Three Thouſand Eight Hundred and Eighty Eight Miles nearer the Sun at Noon, than when he either riſes or ſets to thoſe Inhabitants: But, what is more ſurpriſing is this; they have only one of the five Senſes, (viz.) that of Touching; and yet they can as capably judge of Sounds and Echo's, Light and Colours, as we *Europeans*, who have all the five: And they undeniably maintain, that they ſee the Moon moſt enlightned when ſhe is leaſt; and leaſt when moſt; they alſo are ſuch unheard-of Canibals, that they not only feed upon human Fleſh, but do actually eat themſelves, and yet moſt commonly ſurvive that ſtrange Refreſhment.

ANSWERS to the QUESTIONS, 1741.

The firſt Queſtion anſwered by Mr. *Arden*, Teacher of the Mathematicks in *Derby*.

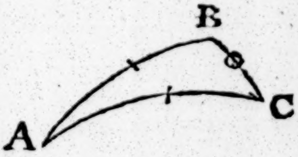
Who firſt juſtly obſerves, that if this Queſtion be taken in a ſtrict literal Senſe, it is over-limited and abſurd; for (ſays he) I do not ſee how the Shadow bearing NNW, can be reconciled with the other Part of the Data; and beſides, there are ſufficient Data without it (" but it not being the Propo- " ſer's Deſign to have the Azimuth given, has cauſed ſeveral " of our ingenious Contributors to miſtake his true Mean- " ing, *&c.*") he therefore takes NNW in a more lax Senſe, and underſtands by it only, that the Shadow reſpected nearly that Part of the Heavens; and then proceeds to ſolve the Queſtion, thus; Let CA repreſent the Height of the Steeple, and Spire; CB ($= 40$ feet $= a$) that of the Spire alone; BD a right Line drawn from the Bottom of the Spire B parallel to the Horizon; DA an imaginary Line drawn from the Bottom of the Tower A; and the Angle DAE $=$ the Complement of the Sun's Altitude. Draw through C, the Point of Interſection D, and the Point E, (which terminates the Length of the Shadow) the right Line EC. Now ſince BD, by the Nature of the Queſtion is Parallel to the Horizontal Plane EA, on which the Shadow was meaſured; and as CE may be conceived as a Ray falling from the Sun; the Angle CEA will meaſure his Altitude; and therefore the Angle ACE (by reaſon of the right Angle at A) will be the Complement thereof: But the Angle DAE, is by the Data $=$ the Complement of the Sun's Altitude alſo; and therefore, becauſe the Angles DAE, and DAC, makes a right Angle, DAB is $=$ his Altitude; conſequently by reaſon of the right Angle in each, the two Triangles CDB, and DAB are ſimilar. Put $z =$ t Comp. of the Sun's Altitude $=$ t $\angle$ C; then by plain Trigonometry, As Radius ($= 1$) : is to a ($=$ BC) : ſo is z ($= \angle$ DCB) : to $za =$ the Line BD. Again, by the ſame As Ra. ($= 1$)



($=1$): BD ($=za$) :: z : zza = BA; Ergo, $a + zza$ = CA. Again, by ſimilar Triangles; as CB ($=a$) : DB ($=za$) : : CA ($=a + zza$) : $az + az^3$ (= EA $= b$); Ergo, $z + z^3 = \frac{6}{a} = 2\ 5$. By reſolving which Cubic Equation we get $z = 1{,}114747$ = the Nat. co tang^t. of the Sun's Altitude; whence his true is found = 41° 54′ 23″; and the Steeple's Height is found by Trigonometry to be 89.706 Feet; Now having found the Sun's Altitude, by the given Month, Day, and Hour; the Latitude of the Place is found 67° 54′ North. Q. E. I.

The firſt Queſtion anſwered by Mr. *William Kingſton.*

Let CB $= b = 40$ = the Height of the Spire (ſee the Fig. above) AE $= d = 100$ = the Shadow's Length; Draw DB parallel to the Horizon; EAD = ACE = the Complement of the Sun's Altitude; conſequently CBD = AEC (by 29 Eu. 1.) Let CD $= a$; *Quære*. Firſt, per ſimilar Triangles $a : b :: d : \frac{bd}{a}$ = AE; and $d\,\frac{bd}{a} :: \frac{bd}{a} \cdot \frac{db^2}{a^2}$ = BD. Then (by 47 Eu. 1) $a^2 - b^2 = \square$ BD $= \frac{d^2 b^4}{a^4}$ and $a^6 - b^2 a^4 = d^2 b^4$ which Equ. reduced gives $a = 59.9021$ = CD. and $\sqrt{a^2 - b^2}$ = BD $= 44.5898$. and $\frac{bd}{a}$ = AD $= 66{,}7756$. Then $\square$ AD $-$ $\square$ BD $=$ $\square$ AE $\sqrt{\ } = 49.7064$ = Steeples Height. Now, for the Sun's Altitude; Let CE $= m$, AC $= n$, and Rad. $= r$. Then $m : r :: n : \frac{nr}{m}$ = AEC = Sun's Altitude = 41° 53′ 38″. Then, for the Latitude of the Place. Let AB = the Comp. of the Sun's Altitude, AC = Comp. of his Declination, BC = Comp. Lat. of the Place. Then SAB : s ACB : : s AC : s ABC.

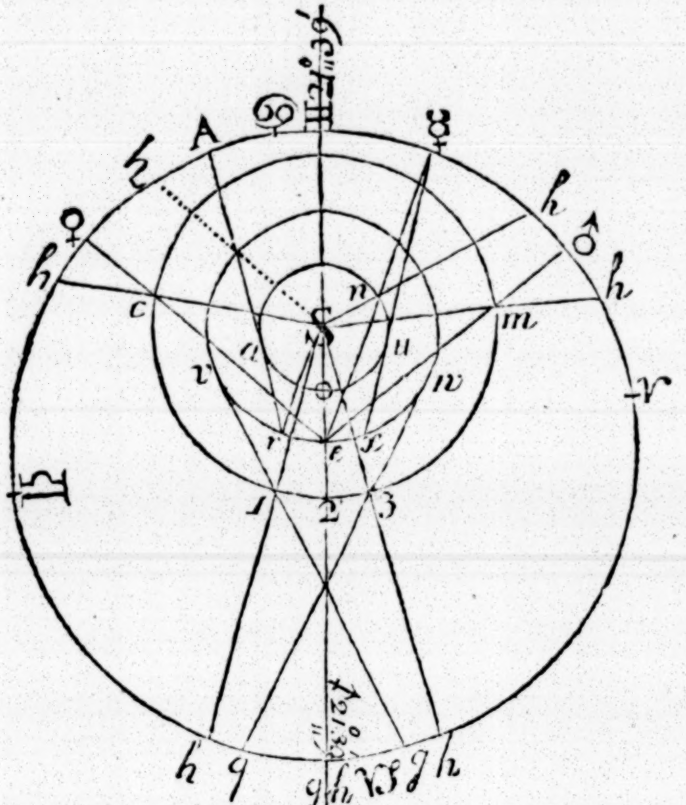


Let $\frac{ACB + ABC}{2} = s$ $\frac{ABC - ACB}{2} = p$ $\frac{AC - AB}{2} = x$;

Then, ſine p : ſine s : : tang^t x : tang^t. $\frac{sx}{p} + z$ = BC = Comp. Lat. = 22° 5′, Hence the Latitude req^d is = 67° 55′ North.

The Second Queſtion conſtructed, and anſwered by the Propoſer Mr. *William Whitehead*.

Draw any indeterminate right Line, as ♊ ♐, in which aſſume ſome Point, as S, to repreſent the Sun: from which, ſe



off each Planet's reſpective Diſtance: As So, Se, S2; and from S the Centre deſcribe their ſeveral Orbs. But to avoid a Multiplicity of Lines, &c. we'll only deſcribe *a*, *o*, *u*, *n*, to repreſent the Orb of ♀ or ☿: *v*, *r*, *e*, *x*, 10, that of the Earth; and *c*, 1, 2, 3 *m*, that of ♂: From *e*, the Earth, as a Centre (becauſe the Geocentric Places of the Planets are given) with any Radius at Pleaſure, deſcribe a Circle. From the Point where the Earth at *e*, beholds the Sun, *i. e.* in ♊ 21 39′ (becauſe the Earth's Place per Queſt. is in ♐ 21° 39 always di

metri

metrically oppoſite to that of the Sun) ſet off 8° 21, which is what the Sun wants of Cancer. From ♋ ſet off 90° both Ways, and you'll have ♈ and ♎; then from ♈ with the Chord of 31° 50′ ſet off the Place of ♂. With the Chord of 62° 21′ that of ☿: And after this manner you may project all their Places. Then from *e* draw the Line *e* ♂, and it will cut the Orb of ♂ at *m*. From S. thro' *m* draw the Line S ♄, and you'll have the heliocentric Place at ♄; and then you may obſerve that ♂ appears at the Earth more forward (according to the Order of the Signs) than when view'd from the Sun; for a Right line drawn from (*e*) the Earth, and another from the Sun, meeting at the Planet, always make an Angle; except when in Conjunction or Oppoſition with the Sun (as the Figure plainly demonſtrates) and this Angle is what *Aſtronomers* call the *Parallax*, and the Angle made at the Earth, the *Elongation*. Now the Figure plainly ſhews, that in this Poſition of ♂, the *Elongation* ♊ *e* ♂, ſubſtracted from the Sun's Place at ♊, will give the Geocentric Place, as it is projected at ♂. Or, if you imagine a Line drawn from the Sun parallel to *e* ♀ (as the prick'd Line S ♄ is drawn parallel to the *e* ♀) here the Angle ♄ Sh = the Angle *ec* S the Parallax (per 29 Eu. 1.) and this Parallax added to the Heliocentric Place at *h*; gives the Geocentric Place of ♂ as before. This, I confeſs, I know not how to demonſtrate by Lines, my Scheme being too ſcanty to draw them to an infinite Length: But I do remember, that, once on a Time, when I was in a very long Walk of Trees, the fartheſt End appeared to me much narrower than the End where I ſtood; therefore I conceive, that if it had been infinitely continued; the Trees on each Side would have appeared as if they really met; Or, if you imagine your ſelf amongſt the fixed Stars, there, by Reaſon of the immenſe Diſtance from the Earth, its whole Orb would only appear as a Point; and this Aſſertion is what the *Optician* can eaſily account for. Therefore though theſe two Lines iſſue from different Points; yet, always keeping parallel to themſelves; they, and the Space by them included, will appear to you as one right Line. Again Suppoſe ♂ paſt the Conjunction poſited at ♀; draw *e* ♀, and it cuts his Orb at *c*; thro' *c*, draw S *h*; here you have the Place of ♂ as ſeen from the Earth, not ſo forward as when beheld from the Sun. Therefore the Parallax *ecs* = ♄, Sh, ſubſtracted from the Heliocentric Place at ♄; or, the Elongation II *e* ♀ added to the Sun's Place, gives the Geocentric Place at ♀. Hence, therefore in the Superiors (♄ ♃ ♂) all the Time they are going from their Conjunction to their Oppoſition with the Sun; the Elongation ſubtracted from the Sun's Place; or, the Parallax added to the Heliocentric Place gives the Geocentric Place. But from their Oppoſition to their Conjunction with the Sun, the Elongation added to the Sun's Place, or the Parallax ſubſtracted from the Heliocentric, gives the Geocentric Place.

Likewiſe in the Inferiors ♀ and ☿, all the Time they are going from a Conjunction with the Sun in the lower Part of their Orb, to a Conjunction with him in the upper Part of it, the Elongation ſubſtracted from the Sun's Place; Or, the Parallax added to the heliocentric Place, gives the geocentric Place: But from a Conjunction with the Sun, in the upper Part of their Orb, to a Conjunction in the lower Part of it; the Elongation adds, or the Parallax ſubſtracts to find the Geocentric Place.

In order to prove this, draw *e* ☿, and it cuts his Orb at *n*; thro' *n* draw S h; here I obſerve that ☿ beheld from the Earth, appears more forward than when view'd from the Sun; and therefore, for the Reaſon above, the Elongation ☿ *e* II ſubſtracted from the Sun's Place; or the Parallax *ens*, added to the Heliocentric Place at ♄, gives the Geocentric Place at ☿, but when it is paſt the Conjunction, in the upper Part of its Orb, you'll find it otherwiſe.

COROLLARY.

Hence by having the Diſtance of the Sun from the Earth, and the Diſtance of the Planets from the Sun; alſo the Planet's Geocentric Place given; we may find the Heliocentric Place: For we have two Sides of a Triangle, and an Angle oppoſite to one of them given to find the other Angle, *i. e.* the Parallax; which, added to, or ſubſtracted from, the Geocentric Place, as the Figure directs, will give the Geocentric Places.

Now, in order to account for the Retrogradations of the

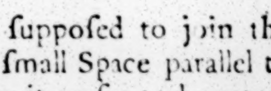
Planets, let us ſuppoſe the Earth at *r*, and ☿ at *a*; here the Earth beholds ☿ at A; let ☿ move to *o*, and in the ſame Time (the Earth being ſlower in Motion) ſuppoſe it to move only to *e*; in this Poſition an Inhabitant of the Earth will ſee ☿ in the Sun. Let ☿ be removed to *u*, and the Earth to *x*, here the ſaid Inhabitant will behold ☿ at ☿; all the while going contrary to the Order of the Signs.

Again, let us ſuppoſe the Earth at *v* and ♂ at 1, here the Earth beholds ♂ at *g*. Let the Earth move from thence to *t*, and ♂ to 2, in this Poſition the Earth beholds ♂ at *gh*: Suppoſe the Earth at *w*, and ♂ at 3; in this Poſition ♂ is ſeen at *q*, all this while likewiſe retrograde.

Here we may obſerve, that when ♀ or ☿ can be ſeen tranſiting the Sun's Disk, they are retrograde. But the chief Thing to be enquired after towards ſolving the Queſtion in Hand, will be to find how many Degrees that Angle contains which is form'd at the Sun, by a Line drawn from thence to the Earth, and another to the Planet, at the Time when it begins, or ceaſes to be retrograde.

Now the Line *ar*, or *v*1, which is ſuppoſed to join the Earth and the Planet, will move ſome ſmall Space parallel to itſelf, juſt before it begins, and alſo after it ceaſes to be retrograde; and how this Angle may be found, is demonſtrated in *Greg. Elem of Aſtronom. Vol.* I. *Book* II. *Pag.* 458, *&c.* I have found the Angle at the Sun, when ♂ begins, or ceaſes to be retrograde, nearly 17° 30; when ☿ begins or ends, nearly 29°; and by the preceding Corollary, the Heliocentric Place of ♂ ♈ 1° 13; of ☿ ♈ 1° 55′. &c. But Time and Room will allow me only to exemplify on theſe two.

And in order to give a more conciſe Solution to the remaining Part of the Queſtion, I'll here premiſe the following Propoſition, together with its Solution.



Suppoſe two Points A and B, to ſet out at the ſame Time from two different Places, whoſe Diſtance = D; both moving towards C with any given uniform Velocity; to find in what Time the Point A, which is ſwifter in Motion, will overtake, or come within ſome given diſtance (*d*) of B.

Let *a*, and *b*, repreſent their Velocities; then per Nature of

the

from the Sun. Therefore the Parallax *ecs* = I, Sh, ſubſtracted from the Heliocentric Place at ♄; or, the Elongatio II *e* ♀ added to the Sun's Place, gives the Geocentric Plac at ♀. Hence, therefore in the Superiors (♄ ♃ ♂) all the Time they are going from their Conjunction to their Oppoſition with the Sun; the Elongation ſubtracted from the Sun' Place; or, the Parallax added to the Heliocentric Place give the Geocentric Place. But from their Oppoſition to thei Conjunction with the Sun, the Elongation added to the Sun' Place, or the Parallax ſubſtracted from the Heliocentric, give the Geocentric Place.

Likewiſe in the Inferiors ♀ and ☿, all the Time they are going from a Conjunction with the Sun in the lower Part of their Orb, to a Conjunction with him in the upper Part of it, the Elongation ſubſtracted from the Sun's Place; Or, the Parallax added to the heliocentric Place, gives the geocentric Place: But from a Conjunction with the Sun, in the upper Part of their Orb, to a Conjunction in the lower Part of it; the Elongation adds, or the Parallax ſubſtracts to find the Geocentric Place.

In order to prove this, draw *e* ☿, and it cuts his Orb at *n*; thro' *n* draw S h; here I obſerve that ☿ beheld from the Earth, appears more forward than when view'd from the Sun; and therefore, for the Reaſon above, the Elongation ☿ *e* II ſubſtracted from the Sun's Place; or the Parallax *ens*, added to the Heliocentric Place at ♄, gives the Geocentric Place at ☿, but when it is paſt the Conjunction, in the upper Part of its Orb, you'll find it otherwiſe.

COROLLARY.

Hence by having the Diſtance of the Sun from the Earth, and the Diſtance of the Planets from the Sun; alſo the Planet's Geocentric Place given; we may find the Heliocentric Place: For we have two Sides of a Triangle, and an Angle oppoſite to one of them given to find the other Angle, *i. e.* the Parallax; which, added to, or ſubſtracted from, the Geocentric Place, as the Figure directs, will give the Geocentric Places.

Now, in order to account for the Retrogradations of the

Planets, let us ſuppoſe the Earth at *r*, and ☿ at *a*; here the Earth beholds ☿ at A; let ☿ move to *o*, and in the ſame Time (the Earth being ſlower in Motion) ſuppoſe it to move only to *e*; in this Poſition an Inhabitant of the Earth will ſee ☿ in the Sun. Let ☿ be removed to *u*, and the Earth to *x*, here the ſaid Inhabitant will behold ☿ at ☿; all the while going contrary to the Order of the Signs.

Again, let us ſuppoſe the Earth at *v* and ♂ at 1, here the Earth beholds ♂ at *g*. Let the Earth move from thence to *t* and ♂ to 2, in this Poſition the Earth beholds ♂ at *gh*: Suppoſe the Earth at *w*, and ♂ at 3; in this Poſition ♂ is ſeen at *q*, all this while likewiſe retrograde.

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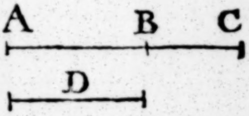


Suppoſe two Points A and B, to ſet out at the ſame Time from two different Places, whoſe Diſtance = D; both moving towards C with any given uniform Velocity; to find in what Time the Point A, which is ſwifter in Motion, will overtake, or come within ſome given diſtance (*d*) of B.

Let *a*, and *b*, repreſent their Velocities; then per Nature of the Problem $a - b =$ the Space &c. that a moves in a Day, &c. more than b; $2a - 2b =$ miles, &c. which a moves in two Days more than b; $3a - 3b$ in 3 Days, &c. Or, univerſally putting $n =$ any Number of Days, then $na - nb =$ the Miles, &c that a travels more than b in any Number of Days; hence therefore, if their Diſtance and Velocities be given; and the Number of Days, &c. be required in which A will overtake B, we've this Equation $na - nb = D \therefore \frac{D}{a-b} = n$. Likewiſe, if their Diſtance and Velocities as before be given; to find in what Time A, will come within ſome given Diſtance (d) of B; we've this Equation $na - nb = D - d \therefore \frac{D-d}{a-b} = n$; Or, given as before, to find when A will be ſome given Diſtance (d) paſt B, we have this Equation $na - nb = D + d$ $\therefore \frac{D+d}{a-b} = n$, &c.

Here D may be taken to repreſent the Diſtance in Minutes of the Earth and Planet, or the Minutes that the Angle eSm, or eSn contains, as given in the Queſtion; $a-b$ the Difference of their Diurnal Motions: And d the Diſtance of the Earth and each Planet in Minutes, at the Time when they begin or ceaſe to be Retrograde.

Theſe Things being premiſed, we ſhall proceed to calculate according to the preceding Hypotheſis; and find,

♂ Heliocen. Place 0ˢ 1° 13
⊖ Heliocen. Place 8 21 39
Diſtance = 3 9 34
⊖ Di. Mot. 59 or 99° 34′
♂ Di. Mot. 31 | 60
$a - b =$ 28 | 5974 = D
$d = 17°$ 30 . $a =$ 60 | 1050
4924 = $D - d$
or $d = 1050$. 7024 = $D + d$

$\therefore \frac{D-d}{a-b} =$ 176 D. bef. ♂ beg. ℞
$\frac{D+d}{a-b} =$ 251 D. bef. ♂ End ℞

☿ Helioc. pl. 0ˢ 1° 55′
⊖ as before 8 21 39
Diſtance = 3 10 16 - 100 16′
☿ Diur. Mot. 4° 5′
⊖ Diur. Mot 0 59
$a - b = 3°\ 6′ = 186$
$d = 29°$
ord. = 1740

But we may obſerve per Fig. that the next ☌ will not be a Retrogr. ☌ ∴ 360° 100°—16′ = 259° 44 = D 239° 44′
60
$D = 15584$
$d = 1740$
$D - d = 13844$
$D + d = 17324$

Therefore $\frac{D-d}{a-b}=74\frac{40}{93}$ Days before ☿ begins his Retrogradation, and $\frac{D+d}{a-b}=93\frac{13}{93}$ Days before he ends ℞

Then I compute the Place of the Sun, and each Planet by adding ſo many Days Motion, as there are Days, before they begin or ceaſe to be retrograde; and I find the Geocentric of ♂ when he begins to be retrograde $4^s\ 0^\circ\ 54'$. When he ended his Retrogradation $3^s\ 12^\circ\ 7'$. Difference $18^\circ\ 37$. which he ſeems to go back. The Geocentric Place of ☿ when he begins to be retrograde is $5^s\ 20^\circ\ 24'$. when he ends it $5^s\ 7^\circ\ 23'$. the Difference $13^\circ\ 1'$ which he will ſeem to go back.

If I have not been ſo exact in the above Operation, as the Reader might poſſibly expect; if he happens to find any Error or Miſtake, I hope he'll chearfully excuſe it, or inform me of it with Candour and Good-will, equal to the ſame with which I offer my Sentiments to the Publick.

The Third Queſtion anſwered by Mr. *John Reynolds*, Jun.

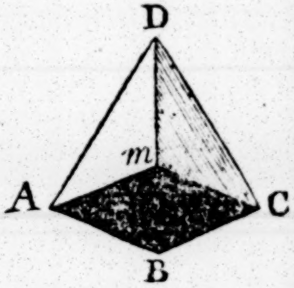
Let S and C = the Sine and Coſine of 11 from 6; p and q = the Sine and Coſine of 10 from 6. 12 inches $=a=$ the Diſtance of the Hour-lines of 10 and 11 per Queſt. Alſo put x for the diſtance of the Hour-line of 10 from the Style, then will $x+a=$ the Diſtance of 11 from the Style ∴ $x : a+x :: c : \frac{ca+cx}{S}=$ the Height of the Style; again $p : x :: q : \frac{xq}{p}=$ the Style's Height, alſo conſequently $\frac{ca+cx}{s}=\frac{qx}{p}$ ∴ $x=\frac{pac}{sq-pc}=10{,}392$; and by Subſtitution $\frac{qac}{sq-pc}=6$ inches the height of the Style. Now the Diſtance of all the other Hour-lines from the Style (and conſequently from each other) may eaſily be found, thus; As the Radius ($s.\,90^\circ$) : to the Height of the Style :: ſo is the tang. of the Hour from 6 : to the diſtance of the Hour-line from the Style. Or, as the Coſ. of the Hour from 6 : is to the Sine of the Hour from 6 ::

6 :: ſo is the Height of the Style: to the Diſtance of the Hour-line from the Style, &c.

Therefore the Diſtance between the Hour-lines of $\left\{\begin{array}{c}11\\10\\9\\8\\7\end{array}\right\}$ & $\left\{\begin{array}{l}10=12 \text{ Inch. p. Da}\\9=4,392\\8=2,536\\7=1,556\\6=1,608\end{array}\right.$

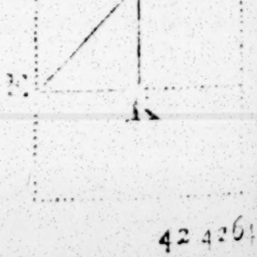
N. B. The Hours of 5 and 4, are the ſame diſtance as their Oppoſites 7 and 8. This Queſtion was truly anſwered by Mr. *Abra. Lord*, Mr. *Arden*, Mr. *Ant. Thacker*, Mr. *William Spicer*, Mr. *Abraham Donn*, Mr. *Thomas Marſhall*, Mr. *Robert Hall*, ——— *Bluhynden*, Mr. *John Dewhurſt*, Mr. *Robert Robinſon*, and Mr. *John Jackſon*.

The Fourth Queſtion anſwered by Mr. *Daniel Howard*.



Given AD $=$ 60 Inches $= b$, Aſſume $x =$ DE; then $b^2 - x^2 = \overline{\text{AE}}|^2$ and AE being $= m$ E per Fig. $\therefore 2b^2 - 2x^2 = \overline{\text{A}m}|^2 =$ Area of the Baſe, which multiplied by $\frac{x}{3} = \frac{2b^2x - 2x^3}{3} =$ *a* Maximun. In Fluxions $2b^2\dot{x} - 6x^2\dot{x} = 0$. Therefore $x^2 = \frac{b^2}{3}$. Therefore $x = 34,641$. And AB $= 69,282$. Hence its Solidity is found $= 55425,624$, &c. Q. E. D.

The Same anſwered by Mr. *William Aldridge*.



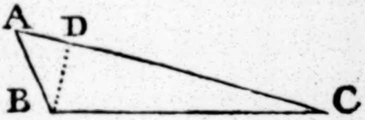
Let AB repreſent a Side of the Square Baſe of the Pyramid, whoſe ſlant Side GE is given $=$ 60 Inches — Put GE $= a$ GK $=$ AE $=$ AG $=$ GB $=$ perpendicular Height $= x$; then per Figure; AB $= 2x$. per 47 E. 1. $aa = 2xx$, & $x = \frac{\overline{aa}|}{2} =$

42,4264.

12,4264, &c. nearly; hence $\frac{Axxx}{3}$ = 101823, 36 the greateſt Solidity.

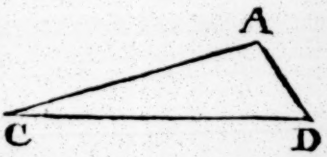
This Queſtion was alſo truly anſwered by Mr. *John Burde-in*, Mr. *George Allen*, Mr. *Richard Hancock*. Mr. *Lord*, Mr. *Ma-ter*, Mr. *Badder*, Mr. *Spicer*, and Mr. *John Jackſon*, who ſays, that Mr. *Heath* has demonſtrated, that when the Areas of ſuch Solids are the greateſt poſſible, they muſt be conſidered as inſcrib'd in a Sphere, &c.

The Fifth Queſtion anſwered by Mr. *George Allen*.



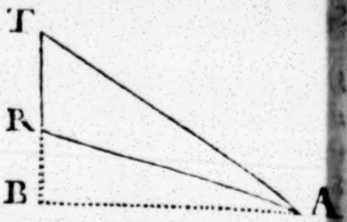
Given AB = 22 = d, and the Angle ABC = 108° 45; the Area = 83 = b. Alſo let AC be = x; then $\frac{2b}{x}$ = BD, and put S = the nat. Sine of the Angle ABC. Then $x : s :: d : \frac{ds}{x}$ = Sine of the Angle ACB. Therefore $\frac{ds}{x} : \frac{2b}{x} :: r : \frac{2b}{ds}$ = BC = 79,65 Chains.

The Same anſwered by Mr. *Arden*.



Let ABC be the Triangular Piece of Land; A the Angle in the River, = (per *Data*) 108° 45′ and B the ſtout Oak: then is AB = 22 Chains (I ſuppoſe per *Gunter*) and the Area of the whole 83 Acres. Put AC = x, and AB = 22 = b; alſo the Sine of 108 45′ = the Sine of 71° 15′ = s; and put 83 = a. Then is $xsb = 2a$ by a well known Rule for meaſuring Triangles, whence $x = \frac{2a}{sb}$ = 79,68 Chains = AC. Hence CB is found by Trigonometry = 89,22 Chains; the Man may therefore find the Place to fix his Land-mark, by ſtriking an Arch from A, with an Extent of 79 68 Chains to C, and croſſing it with another ſtruck from B with a Radius of 89,22 Chains.

Mr. *Robert Robinſon* ſolves the Fifth Queſtion, thus:

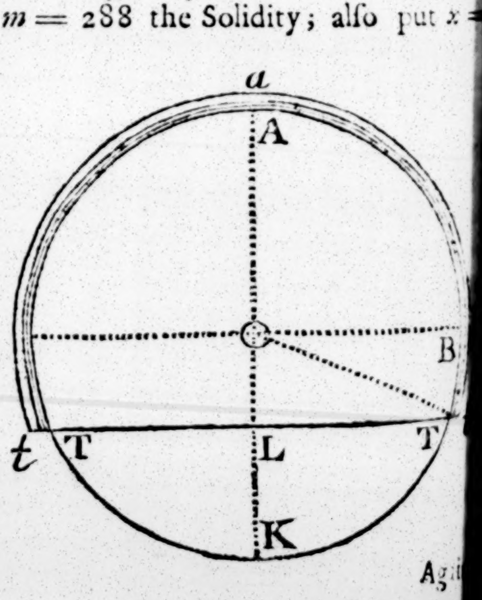


Divide the double Area = 1660 Square Chains, by TR = 22, and the Quotient is $75\frac{5}{11}$ = the perpendicular AB let fall upon TR produced; Now, here is given TR = 22, AB = $75\frac{5}{11}$ Chains, and the Angle TRA = $108^{d}\ 45'$; whence the Field ARTA may be conſtructed Geometrically, and the Sides Trigonometrically calculated; thus, as the Sine of the Angle ARB : is to AB : : ſo is Radius; to AR = 79,68333; and ſo is the Coſine of the Angle ARB: to RB = 25,61337, thence TB = 47,61337, & $\sqrt{\overline{AB}|^2 + \overline{TB}|}$ = AT = 89,2212 Chains.

This Queſtion was alſo truly and methodically anſwered by Mr. *William Kingſtone*, Mr. *Alex. Naughley*, Mr. *Walter Trott*, Mr. *Rob. Hall*, Mr. *William Chapple*, Mr. *Abra. Donn*, Mr. *Thomas Marhall*, Mr. *John Reynolds*, Jun. Mr. *J. Jackſon*, and Mr. *W. Spicer*.

The Sixth Queſtion anſwered by Mr. *Robert Robinſon.*

Let $n = 36$ = once the Length, + twice the Breadth, and thrice the Depth; and $m = 288$ the Solidity; alſo put $x =$ the Breadth $y =$ the Length, then will $\frac{n-y-2x}{3} = \frac{m}{xy} =$ the Depth of the Stone ∴ $nxy - xy^2 - 2x^2y = 3m$. Here we have but one Equation, and two unknown Quantities, which will be found thus. The Fluxion of the Equation, ſuppoſing y to flow, is $nx\dot{y} - 2xy\dot{y} - 2x^2\dot{y} = 0$ ∴ $n - 2y = 2x$;



Again, making x flow, the Fluxion of the ſaid Equation will be $ny\dot{x}-y\overset{2\,\cdot}{x}-4yx\dot{x}=0$. Ergo, $n-y=4x$. Therefore $n-y=2n-4y$ ∴ $y=\frac{n}{3}=12$ Inches, the Stone's Length. And $x=\frac{n}{2}-y=6$ Inches the Breadth; and the Depth is $\frac{m}{xy}=4$ Inches. Then to find how many ſuch Stones will wall Mr. *Heath*'s Park, allowing its Area = 97 Acres, and the Wall 7 Feet 4 Inches high, and one foot thick.

Let ATLT repreſent the Park (as in the *Lady's* Diary 1741, *Page* 12) where TLT = 3 Furlongs = 660 Yards; now to find the Radius of the Park here is given LT $=330=m$; and the Area of the Circular Segment (or Park) TABT = 97 Acres = 469480 ſquare Yards $=n$; Let z = the *Arc* KT, $y=$ LT its Sine, Radius = Unity; and $q=3{,}1415926=$ Area of a Circle, whoſe Radius is Unity; Then $z=y+\frac{y^3}{2.3}+\frac{3y^5}{2.4.5}+\frac{3.5y^7}{2.4.6.7}$ &c. which let = A, then $\frac{A}{2}=$ Area of the Sector KOT; $\sqrt{1-y^2}=$ LO, and $\frac{y}{2}\sqrt{1-y^2}=$ Area of the Triangle LOT, and $A-y\sqrt{1-y^2}\doteq$ Area of the Segment TLTK; and then, $q-A+y\sqrt{1-y^2}=$ Area of the Park, when the Radius is = Unity. Then ſay, $y^2:m^2::q-A+y\sqrt{1-y^2}:\frac{m^2q-m^2A}{y^2}+\frac{m^2}{y}\sqrt{1-y^2}=n$, the Park's Area: Reſtore the Value of A, and we have $y\sqrt{1-y^2}+q-\frac{ny^2}{m^2}=y+\frac{y^3}{2.3}+\frac{3y^5}{2.4.5}+\frac{3.5y^7}{2.4.6.7}$ &c. ſolv'd $y=.792842$; Then $.792842:1::330:416.26204$ Yards = OT the Park's Radius; and the Radius to the out-ſide of the Wall is O6 = 416,59537 Yards; and thence we find the Space TABT *tabt* = 616.46083 ſquare Yards = the Area of the Wall's Baſe; and its Solidity = 1506.90425 Cubic Yards. Then, as one Stone's Solidity = $\frac{1}{162}$ Cubic Yard, is to one

Stone, ſo is the Solidity of the Wall = 1506.90425 Cubic Yards, to the required Number of Stones = 244118,4885.

Mr. *Ant. Thacker*'s Solution of the Sixth Queſtion.

Here is the Method of Queſtions limited by two Equations, tho' there be never ſo many unknown Quantities; Let x, y and z, be the Length, Breadth, and Depth of each Stone; then $x + 2y + 3z = 36$ Inches $= b$, and $xyz = 288$.

General Method of Solution.

Divide the Sum, to which the unknown Quantities multiplied by theſe reſpective Factors are made equal, by the Number of Terms, and the Quotient being made equal to each particular Term, the Value of each unknown Quantity may be found.

$$\text{Thus}\left.\begin{array}{l}\frac{b}{3} = x\\ \frac{b}{3} = 2y\\ \frac{b}{3} = 3z\end{array}\right\}\left.\begin{array}{l}x = 12\\ y = 6\\ z = 4\end{array}\right\}\text{Inches required; whence the reſt &c. may be found.}$$

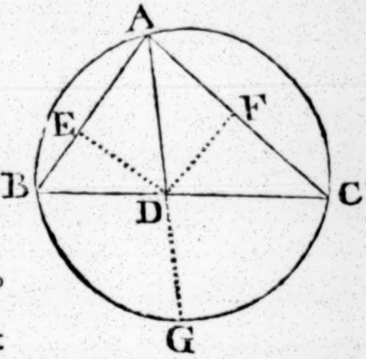
Mr. *John Burdekin*, Mr. *George Allen*, Mr. *Daniel Howard*, Mr. *Abra. Lord*, Mr. *Rich. Hancock*, Mr. *John Rubens*, and ſeveral others, brought out true Dimenſions of the Stone; but ſome miſtaking the Park for a Square, ſome a circular Form, &c. occaſioned a Variety of Anſwers to this Queſtion.

The Seventh Queſtion anſwered by Mr. *Abra. Lord*.

Firſt there is given the Height of the Tower = 195 feet; now (*per Torric. de Motu Gravium Deſcen. Lib.* I.) 16 ½ Feet : 1 + 1 : : 195 Feet : to the Square of the Time the Body is in falling to the Surface of the Water = 3,48 Seconds —— But Water is to Lead as 1000 : is to 11343, (and *per Dr. C*[illegible] *in Phil. Tranſ.* N°. 401. *pag.* 381.) the Forces are as the Velocities themſelves; therefore 101 23 will be the Velocity of the firſt Second in Water; conſequently ,7746 Seconds will be the Time of the Vertical Fall in the Water; and the Time of the Ball's Falling from the Top of the Tower to the Bottom of the Ciſtern will be 4,25 Seconds; that is, the Ball hath accelerated a leſſer Space by 34 64 Feet, than if it had fallen in Air.

Mr. *William Chapple*, Mr. *William Spicer*, Mr. *Alexan* [illegible]*ley*, Mr. *John Jackſon*, and others, anſwered this Queſtion.

The Eighth Queſtion anſwered by Mr. *William Butcher*.



Let AB $= a$, AC $= p$, AD $= t$; and the Sine of the Angle BAD $= x$; its Coſine y, Then $\frac{ax}{t-ay} = \frac{px}{py-t}$ = the Tangent of the Angles BDA and CDA reſpectively $\therefore tp - apy = apy - at \therefore 2apy = tp + ta$; and $y = t + \frac{p+a}{2ap}$. If s be put for the Sum of the Sides, *i. e.* $p + a = s$; then, $\frac{st}{2ap} = y$, the Sine Com. of the Angles BAD, or CAD: And by this it appears what an Agreement there is between plain Triangles and Spherics. See *Gent. Diary* 1741, *pag.* 46.

Mr. *Arden* anſwers the Eighth Queſtion thus.

In the Triangle annexed (ſee the Fig. above) are given the Sides AB $= a = 25$ Chains, AC $= d = 36$; and AD (which per Data biſects the Angle BAC) $= 24$ Chains $= p$ from whence BC is required, put the Segment BD $= x$; then (*per* Eu. 6. 3.) as $a : x :: d : \frac{dx}{a}$ = the Segment DC. Again (by another Theorem) ad (= AB + AC) − BD + DC $= \overline{AD}^2$. That is, $ad - \frac{xxd}{a} = pp$. Ergo, $aad - xxd = app$ and $aad - app = xxd$. Ergo, $xx = \frac{aad - app}{d}$, and $x = \sqrt{\frac{aad - app}{d}}$ = 15 Chains; whence the other Segment is found by the above-quoted Propoſition of *Euclid* = 21 60 Chains; and therefore the required Line BC is found = 36 Chains 60 Links

Mr. *William Spicer* of *Coventry* gives the following Solution.

In the Triangle ABC, let fall the Perpendiculars DE DF

(ſee

(ſee the Fig. above) then it is plain (by 4. Eu. 1.) that the right angled Triangles DEA, DFA are equal both in Sides and Angles. Put AC $= 36 = b$ AB $= 25 = c$; and AD $= 24\ d$; BD $= x$, and CB $= a$; Then (by 3. Eu. 6.) BA : BD :: AC : CD. *i e.* $c : x :: b : \frac{xb}{c} =$ CD; and $\frac{bx+ex}{c} = a$ (by Eu. 13 2.) $\frac{d^2+c^2-x^2}{2c} =$ AE and $\frac{c^2d^2+c^2b^2-b^2x^2}{2bc^2} =$ AF, but AF $=$ AE, hence $\frac{d^2+c^2-x^2}{2c} = \frac{c^2d^2+c^2b^2-b^2x^2}{2bc^2}$; Now, by Reduction, and Tranſpoſition $x = \sqrt{\frac{c^2d^2+c^2b^2-bcd^2-bc}{b^2-bc}}$ $= 15$ *Ch*: and $a = 36$ *Ch.* 60 *L.* $=$ CB the Baſe required.

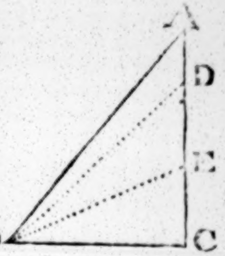
Mr. *Robert Hall* of *Boſton* ſolves the ſame Queſtion thus:

Let the Triangle be inſcribed in a Circle (ſee the Fig.) and AD produced to G; put $a =$ DG, $b = 24 =$ AD, $c = 36 =$ AC, and $d = 25 =$ AB (then per *Pardie's* Geom. El. B6. Prop. 71) $d : b :: a + b : c \therefore dc = ba + b^2$; $a = \frac{dc-b^2}{b} = 13{,}5 = f$; Put $e =$ BD, Then (*per* Eu. 3 6) $d : c :: e : \frac{ce}{d} =$ DC. And (*per* Eu. 35. 3) BD × DC = AD × DG $\therefore \frac{ce^2}{d} = bf$. Reduced $e =$ $\sqrt{\frac{fbd}{c}} = 15 =$ BD. Whence BC $= 36$ *Ch.* 60 *Lin.*

This Queſtion was alſo ingeniouſly and methodically ſolved by Mr. *Geo. Ingman*, Mr. *William Whitehead*, Mr. *John Reynolds*, Jun. Mr. *Tho. Mather*, Mr. *John Burdekin*, Mr. *John Mayer*, and ſeveral others. See the Catalogue at the End of the Book.

The Ninth Queſtion anſwered by Mr. *Richard Hancock*

In order to give a Solution to, this Problem, let us ſuppoſe a Triangle Similar to the propoſed one, which may eaſily be conceived by the known Angles. Let BC $= \sqrt{75} = 8{,}66 =$ b. and AC $= 5 = p$; Alſo AB $= 10 = h$; then I find by Trigonometry, making Radius $= 10$, that BD + AD $=$ $= 20{,}1788 = g$; Now, by ſimilar Triangles ſay, A $g : f$:

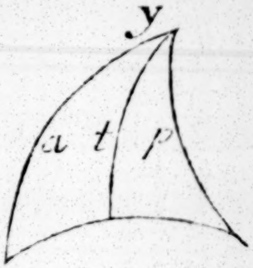


$\frac{ps}{g}=AC=$ the true perpendicular. Again As $g:b::s:\frac{bs}{g}=BC=$ the true Baſe; conſequently $\frac{ps}{2g}\times\frac{bs}{g}=\frac{bps^2}{2g^2}=$ the Area, making s, any Number at Pleaſure.

Mr. *Daniel Howard* ſolves it thus:

Given $BD+DA+AB=s$; and the Angle $EBC=$ the Angle $ABE=15°$; Alſo $ED=EC$. Whence making a Fig. ſimilar to the given one, then in the ſimilar Triangle $AB+BD+DA=20{,}173=d$, then $d:5::s:\frac{5s}{d}=$ the true Perpendicular $=AC$. And again, $d:8{,}66::s:\frac{8\,66\,s}{d}=$ the true Baſe $=BC$. Therefore $\frac{5s}{d}\times\frac{8\,66\,s}{2d}=\frac{43{,}3\,s^2}{2d^2}$ Q. E. D. which is a ſtanding Theorem for all Queſtions of this Nature.

The Tenth Queſtion anſwered by Mr. *William Butcher*.



Let $t=$ Tang. of the middle Latitude,
$a=$ Sine of one of the other,
$p=$ Sine of the other.
$y=$ Sine com. of the Angle.
$s=$ Sine of the Sum of the Area.
and $c=$ its Coſine.

Then $\frac{st}{2pa}=y$ (ſee *Gent. Diary* 1741) but $s\sqrt{1-aa}+ac=p$; which being multiplied by $2ay$, and reduc'd becomes $st-2a^2cy=2say\sqrt{1-a^2}$ involved it becomes $s^2t^2-4sta^2cy+4a^4c^2y^2=4s^2a^2y^2-4s^2a^4y^2$; when reduced $a^4c^2y+s^2a^4y-s^2a^2y\,sta^2c=-\frac{s^2t^2}{4y}$; *put* $b=c^2y+s^2y$; and $d=s^2y+stc$; Then $a^4-\frac{d}{b}a^2=-\frac{s^2t^2}{4yb}$ and by Com. □ &c. $a^2=\sqrt{\frac{1}{4}\frac{dd}{bb}-\frac{sstt}{4yb}}+\frac{1}{2}\frac{d}{b}$; Therefore $a=\sqrt{\sqrt{\frac{1}{4}\frac{dd}{bb}-\frac{sstt}{4yb}}+\frac{1}{2}\frac{d}{b}}$.

NEW ÆNIGMA's *to be anſwered next* YEAR.

(1.) ÆNIG. 5. *by* R. CESTRIENSIS.

WHEN *Sol* refulgent firſt with Luſtre ſhone,
And *Cynthia* did the lucid Sky adorn:
From each by Turns had I *primordial* Birth,
And choſe a Place of Reſidence on Earth.
Sages! On you I chiefly do attend
An humble Servant; tho' deceitful Friend;
Deceive I ever do, diſpleaſe and pleaſe,
Endow'd with Glory; yet obſcure my Ways:
Various my Shape; promiſcuous Habits wear,
A *Man*, a *Mouſe* a *Monkey*, *Ape*, or *Bear*!
A fawning *Courtier*, *Raſcal*, *Paraſite*,
A *Soldier*, *Miller*, *Thief*, or *Yorkſhire Bite!*
Guided by them whene'er they go abroad,
Yet often miſs with *Vagabonds* my Road.
I ſeldom; never, leave the Blooming Fair,
When they for Shelter to thick Groves repair;
When thither they with gentle Pace retreat,
To ſhun the Sun's too ſultry ſcorching Heat.
At other Times perceptible am ſeen,
To dance o'er flow'ry *Meads*, or limpid *Stream*;
Where *Fawns*, and *Nymphs*, and gentle *Zephyrs* play,
But keep within-doors on a gloomy Day;
Then by the Fire I ſit, or ſtand upright,
A Foe to Darkneſs, but a Friend to Light.
Before my Betters ever take the Wall,
Yet at their Feet an humble Proſtrate fall;
Am here, and there, and no where at ſame Time;
So impudent, behind their Backs can climb.
But leſt you think I've left you in the dark,
I'll further help you by a clear Remark;
Since more may of the *Harlequin* be ſaid,
In th' Morning living! but before Night dead!
A new Day comes —— my genial Birth retain,
At Noon the Spectre's viſible again:
The ſame ſtill ſhall —— and not the ſame endure,
Till all things end, and Time ſhall be no more.

(2) ÆNIG. 6. *by Mr.* WILLIAM DURANT.

YOUR Patience I muſt beg whilſt I relate
My Pedigree, and my peculiar Fate;

Knew

Know that I was before that Roman Name,
That only came, and look'd, and overcame:
Or ancient *Troy*, or *Perſia*, or *Greece*,
Or any of the *Babylonian* Race;
It was not *Nimrod*, nor his lawleſs Crew,
That could attack my Walls, nor me ſubdue:
For you muſt know, I have a *Cittadel*,
Built firm and ſtrong, in which I ſafely dwell;
Which ſtill defends me from the bloudy Jarrs,
Of my own Country, which is oft at Wars:
'Tis not the *Bow* and *Arrow*, which I fear,
Nor any ancient Inſtrument of War.
But ſince th' Invention of the bloudy *Gun*,
Have Thouſands of my Natives been undone:
For, now-a-days, we're made a common Prey
To ev'ry *Fool* that will; and can't ſay Nay;
Yet, I confeſs, we've found peculiar Grace
With the *Fair Sex* allow'd to kiſs their Face:
Soft be it ſpoken ——— may be to their Shame,
They call their Offspring by my *Foreign* Name,
Nay, oft, they ſqueeze, and hug me, which is more,
Whilſt their own Offspring they turn out of door.

(3) ÆNIG. 7. *by Mr.* ABRAHAM LORD.

YOU Artiſts give Ear, and I will declare,
A wonderful Story to you;
Of a Man that was bred in *Afric*, 'tis ſaid,
As in Hiſtories old you may view.
On the Mountains Tops he his Lady did court,
And to him ſhe proved moſt kind:
For by Night or by Day, did they e'er go aſtray,
Since in *Hymen's* Bands they were join'd:
Many Ages ago, as the *Poets* do ſhow;
Since this loving Couple did meet;
And ſtill they're together, nor ever did ſever,
But lovingly ſtill they do greet.
His Surname he had from his Lady, 'tis ſaid,
Not like other Men on this Frame:
She more noble doth ſeem, and bears moſt Eſteem;
For that ſhe ne'er changed her Name.

He monſtrous appears, now advanced in Years,
  Not *Brobdingnag* e'er had a ſtranger;
Nor *Lilliput* neither aſſur'd you will be, Sir,
  When you've hit on the Name of this Ranger.
O'er *Bogs*, *Brooks*, and *Rills*, over *Meadows* and *Fields*,
  Full many a Time has he travell'd;
Yet ſeldom appears when *Sol* he is near,
  But Light with him commonly carries.
His kind Lady alſo, along with him does go,
  Moſt lovely ſhe is to behold, Sir;
So bright ſhe doth ſeem, that the *Paphian* Queen,
  To rival her Charms never could, Sir.
Like the mild *Turtle-dove*, ſhe's as true to her Love,
  As *Penelope* was to *Ulyſſes*;
And once on a Time, as you read in old Rhime,
  She lull'd him aſleep with her Kiſſes.
Now if I give over, you ſoon will diſcover,
  The Name of this monſtrous Man, Sir;
For I gueſs you have ſeen, both him and his Queen;
  And perhaps you and I may again, Sir.

(4) ÆNIG. 8. *by* R. CESTRIENSIS.

WHEN our firſt Parents were in *Eden* plac'd,
And all things with celeſtial Beauty grac'd;
I pure remain'd, unblemiſh'd ſeem'd to be,
'Till they partook of that forbidden Tree;
Which *Death* entail'd on their Poſterity.
And ever ſince, tho' by the *Bad* deſpis'd,
Am by the *Good* and Generous highly priz'd.
Sages attend! I gladly ſuch reclaim;
Who to their *Luſt* have ſacrific'd their *Fame*:
I'm no Deceiver, but a ſincere Friend,
Since that I act with no deceitful End;
To me the *Fair*, th' Unſpotted, and the *Young*,
As *Saints* and *Seraphs* liſten to my Song.
How oft have I, for my Integrity,
Been call'd to Bar, and after doom'd to *die!*
All this the fawning *Sycophant* knows well,
Who lurks to gull me whereſoe'er I dwell;
But ever (Thanks aſcrib'd to Pow'r divine)
I can with *Mirror* uneffected ſhine;

Bright as the *Sun* illuminates the Moon;
Or *Cynthea* fair, that gilds her Silver Horn:
In ſhort, I raiſe my Heroes to Renown,
Reward them with a never-fading Crown.

(5) ÆNIG. 9. *by Mr.* WILLIAM CHAPPLE.

GOOD Sirs, pray attend to an [illegible] Creature,
Which is yet not the leaſt of the Works of Nature:
'Tis true, I was born to be *hang'd* [illegible])
And am always with *Halter* and [illegible];
For which, tho' ſome *Moderns* [illegible],
An ancient Philoſopher counted me [illegible]
My *Eyes* are ('tis ſaid) half a Dozen, or more,
Which my *Hands* and my *Feet* make up near a Score.
In my Tent deck'd with Art, like a cunning *Coquette*,
I ſit and allure ſilly *Fools* to my [illegible]
I with Eaſe climb [illegible] when you know me,
No *Tumbler*, or *Rope-dancer* e'er could out-do me.
I've a Rival who hunts me where-ever we meet,
Who, as oft as he does ſo, is ſure to be beat;
Tho' a Giant unto me, he quickly compounds,
And haſtens to ſeek out a *Cure* for his Wounds.
I ſeldom am idle, but work at my *Trade*,
Which in *Britain* (they ſay) is at preſent decay'd:
Yet I find Employment in Country and Town,
In the *Palace* with GEORGE, or in *Cotts* with the Clown:
Nay I've ſometimes abode in an Out-houſe or Stable,
And once a whole Week at a Gentleman's Table,
But on Saturday Night I was thrown on the Floor,
Contemptuouſly us'd, and driven to the Door.

(6) ÆNIG. 10. *by* R. CESTRIENSIS.

WE, Gentlemen, are two Travellers rare,
Around the Earth's Orbit we range,
To our *Maſter* we're true, and faithful to *you*,
Tho' often *are given to Change*.
When you riſe in the Morn, yourſelves to adorn,
Obedience unto us ye pay:
But when you're in Bed, be ye ſingle or wed,
(As *never the* [illegible]) keep the Day.

Where-ever ye go, attend ye we do;
And when ye're diſpos'd to ſit down;
To the Right or the Left, tho' of *Reaſon* bereft,
Great Revenues bring to the Crown.
Geographers ſay the *Antipodes* may
(Tho' ſome do it flatly diſown)
If each others Feet together ſhould meet,
They'd oppoſite be to your own.
Be this falſe or true, we needs muſt tell you,
Tho' they cannot your due Weight ſuſtain;
Brave *HADDOCK*s we bear, yet ſafely may ſwear,
From his Honour ſhall nothing obtain.
Sometimes we're dreſs'd fine, as the Stars above ſhine,
With a *Lady*, a *Fop*, or a *Beau*;
But when forc'd to reſort with the Poor and mean Sort,
We make but a pitiful Show.
The *Indians* dark are, yet what need we care,
If we their dull *Colour* aſſume?
We're oft dreſs'd in *Green*, and in *Red* often ſeen,
And we're hugely in Vogue too at *Rome*.
As *Puppets* we're ſhown in moſt Places, 'tis known,
But when we are gone to decay;
Two more of our *Race* ſupply the ſame Place,
If newly created to Day.
And now to conclude, leſt you ſhould think us rude,
Familiar with you and the Fair;
We'll e'en bid you Adieu, for without much Ado,
Look about, and you'll ſee what you are.

[7] ÆNIG. II. *by* J. DEWHURST.

YOU, prying Sirs, my Name declare,
For I'm a tickling Blade I ſwear;
And by my toſſing to and fro,
Have produc'd many a *Raree-ſhow*.
I am a Painter; No, I lye.
And like enough, for do but eye
Your beſt Apartments; there diſplaid,
My curious Art is open laid.
Perhaps you'll ſee both *Beaſts* and *Birds*,
Green *Meads* and *Rivers*, *Flocks* and *Herds*:
In ſeveral Pieces I could name,
Which are both *Sacred* and *Prophane*;

And tho' no *Scribe*, have often ſet
All th' Letters in the *Alphabet*.
On moſt of the known Globe I'm found;
On *Engliſh*, *French*, and *Spaniſh* Ground;
But th' naked *Indian* never yet,
My Power knew, elſe he'd permit
My Landing on his burning Coaſt;
Since I to clothe the *Naked* boaſt.
I have a Tail, 'tis very true;
That's *Black*, or *White*, ***Green***, ***Red***, or ***Blue***.
And like the groveling Mole I hollow,
Room with my Noſe for Tail to follow:
And all my Store, alas! I ſpend
To Pleaſure and aſſiſt my Friend;
Yet need not grudge, for when my Store
Is all exhauſted I have more;
Elſe in ſome pleaſant Place am I
Put with my *Siſters* bright to lie;
There, like the *Great Turks Women*, we
In our Apartments forc'd to be,
Till our *Grand Signor* 'mongſt us chuſes,
Who'll ſerve his Turn, the reſt refuſes.
By this you'll know, Sirs, what my Name is,
For I do ape old *Polyphemus*,
Who by *Ulyſſes* his Eye loſt,
So *fiery* Points thro' mine's oft toſt.
I've a Relation gone to *Seas*,
Whoſe curious Art does all Men pleaſe,
He guides the *Sailor*, is ſo priz'd,
In ev'ry *Port* monopoliz'd:
He fickle, wav'ring ne'er can reſt;
Until the Object he likes beſt,
Be found; He's then a conſtant Spark;
Altho' ſhe's of a ſtony Heart.
I've other Kinſmen on the Land,
You'd think were deſtin'd to be hang'd;
For the *Nooſe* o'er their Head is caſt,
Thrice fifty Times a Day at leaſt.
If the learn'd *Surgeon* heave your *Vein*,
To let you *Blood*, and miſs his Aim,
No *Blood* he gets; now this I'll ſay,
If I draw *Blood*, I miſs my Way:

Yet ſeveral Operations I
Do oft perform in *Surgery*;
But when thoſe Acts I undertake,
I like to *Proteus* change my Shape.
  I have a *Maſter*, Fye upon him,
He's ſure no Man, a P— light on him;
For he with *Iron*, *Steel*, or *Braſs*,
Does bruiſe my *Head* to make me paſs:
And with ſuch Fury, that ſometimes
My glitt'ring Fabrick all disjoins;
Then caſt away (my Caſe deplore)
And never am regarded more.
  Take this Hint more, and then I'll ceaſe;
When you to *Lettice* make Addreſs,
Perhaps on her ſoft Lap I'm laid;
Squeez'd and careſs'd by that Fair Maid.

NEW QUESTIONS to be anſwered the next YEAR.

[1] Queſt. 11. *by Mr.* JOHN JACKSON.

IN Northern Clime, where *Sol's* bright Beams
O'erſpread the Groves, and flow'ry Plains;
When juſt due Eaſt he did appear,
His Altitude I obſerv'd there;
And found preciſely for to be
Minutes Nine, and Degrees Forty three:
Likewiſe the intermediate Space,
Between the Zenith of the Place,
And Equinoctial in the Heav'n,
Is in the Margin * truly given:
To th' Declination at that Time;
(Th' Remarks were made in Northern Clime.)
Now Analytic *Diarian* Train,
Next Year unto the World explain;
This Quere which now lies conceal'd,
'Till to the World it be reveal'd:
The Latitude o'th' Place, I pray,
Likewiſe the true Hour of the day,
When juſt due Eaſt *Sol* did aſcend,
Kind Gentlemen, Aſſiſtance lend.

[2] Queſt.

[2] Queſt. 12 *by Mr.* ABRAHAM LORD.

There is a Quadrant of a Circle, whoſe Radius is = 10 Feet, and in it there is a Circle inſcrib'd, which touches both the Radii, and the Concavity of the Limb thereof; and, in one of the Curve Corners, there is a little Circle inſcrib'd; ſo that it touches both the Radius of the Quadrant, the Concavity of the Limb, and the Convexity of the inſcrib'd Circle; The Area of this little Circle is requir'd?

[3] Queſt 13. *by Mr.* ARDEN.

WHAT Annuity (x) forborn (x) Years, at (x) Pounds per Cent. Compound Intereſt will amount to 100 Pounds?

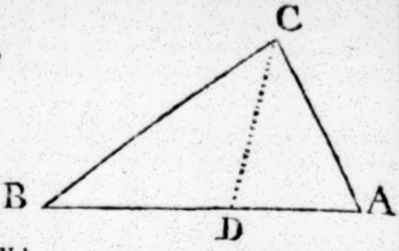
[4] Queſt. 15. *by Mr.* JOHN BURDEKIN.

HOW frequent it is for ſome Men to deride, offer to baffle, or even endeavour to deſtroy Mathematical Learning; for no ſooner does the *Geometer* begin to demonſtrate, that by the Flux of a Point a Line is generated; by the Motion of that Line a Superficies; and by the Flux of that Superficies there is produced a ſolid Body; but, hold! ſtay! cries the bewilder'd *Sophiſter*, and all in a Hurry boldly denies the very Exiſtence of a Solid; ſtrongly maintaining, by dint of Argument, that all Bodies are, and ever will be, porous, until the Great and All-wiſe Creator alters the whole Courſe and Fabric of Nature. But where's that great *Naturaliſt*? where's the bold *Philoſopher*? who dares deny, that the leaſt Particle of Matter may be made to fill the greateſt Space, nay even the whole Orb of Saturn! ſo that there is no Pore therein, whoſe diameter may exceed the leaſt Line poſſible; or $\frac{12}{10000000000000000000000000000000000000}$ part of an Inch. Therefore allowing all Bodies to be porous, let us only ſuppoſe a Solid in the Form of a Sphere or Globe, whoſe diameter is 24 Inches; I demand of all you Sons of Art, the Solidity of the largeſt *Icoſahedron*, or Figure of 20 equal Sides, that can poſſibly lie within ſuch a Globe; and alſo its ſpecifick Gravity, each Cubic Inch 6 Ounces *Troy*; the Weight alſo?

[5] Queſt. 15. *by Mr.* ABRAHAM LORD

LET a Bar of Steel perfectly *Elaſtic* be ſuſpended at both Ends; and allowing that 10 hundred Weight *Avoirdupois* hanging in the middle, to break the ſaid Bar: It is required the Weight of a Globe falling down 185 Feet, in a direction perpendicular to the Horiſon upon the middle of the Bar to have the ſame Effect?

[6] Queſt. 16. *by Mr.* WILLIAM BUTCHER.



As I went forth one Ev'ning tide,
Down by a pleaſant River's ſide;
A *Geodeſian* I did ſpy
Surveying of a Mead hard by:
Triangular he found it was,
A Line too from one Side did paſs
That cut an Angle equally,
Which he perceived then was dry;
Is in the Figure mark'd *C D*.
Its Length is || Chains juſt Twenty three. || *per Gunter.*
Likewiſe the Side that's mark'd AB,
Was 50 Chains (as he told me)
Alſo an Angle * then he found, * ADC = 60°.
Which he could come at on dry Ground:
Theſe Notes were all that he could get,
(Becauſe the Meadows were ſo wet)
But hopes ſome Friend will be ſo kind,
To bring the reſt into his Mind;
'Mongſt the *Diarian* Youths he hopes to intercede,
To find the Sides of the inundated Mead.

[7] Queſt. 17. *by Mr.* ROBERT ROBINSON.

JANUARY 20th. 1741. in the Morning; when taking a Ride upon *Huntcliff-Banks* (a mountainous Place in the N. Eaſt of *Yorkſhire*) in Latitude 54° 32′. Amongſt the many Remarks I then made, I cannot omit taking Notice of the following (*viz*) Two Ships lying at Anchor, Eaſt and Weſt of each other, and one Mile diſtant, as near as I could determine: I had alſo in View the Steeple of a neighbouring Church; which three Objects appeared to be of an equal diſtance from me, and the Steeple to be four times as far from the Weſtermoſt Ship, as the Ships were from each other: I then obſerved *Oculus Tauri* ſetting in the Weſtern Horizon, in a direct Line with me and the Steeple: Now from theſe *Data* I hope ſome ingenious Gentleman will inform me, how far I was diſtant from each Object; with the Bearing of each Ship from the Steeple; and alſo the Hour that this Obſervation was made.

[8] Queſt. 18. *by* Mr. RICHARD WHITEHOUSE.

THERE is an *Iſoſceles* Triangle, whoſe Side being added to the Square Root of three times it ſelf is = 60 Inches: *Quære*, the Side and Baſe of the Triangle, whoſe Area is a *Maximum*?

[9] Queſt.

[9] Queſt. 19. *by Mr.* John Jackson.

ON the Terraqueous Globe two Iſlands lye,
Each Latitude's * i'th' Margin ſhewn;
Their Bearing I cannot deſcry.
Likewiſe their diſtance is unknown,
One Time (remembring very well)
I with an Artiſt did converſe,
Deſiring him that he would tell,
How I might ſhape a direct Courſe;
When from the Northmoſt of the two
Unto the other I did ſail;
Begg'd earneſtly he would declare
A Theorem which would never fail.
Forthwith he granted my Requeſt,
In *Analytic* * Terms, as here.
Which me with various Thoughts poſſeſs'd,
How I might Courſe and Diſtance know:
But all my Methods prov'd in vain,
I ſeriouſly do now confeſs;
Pray, *Gentlemen*, reſolve the ſame
Unto a Mar'ner in Diſtreſs.

* 40° 00'. and
39 42' North.

* *You muſt ſail on a certain Courſe between the South and the Weſt ſo that the Square of your Diſtance* × 281475067037184 *leagues may be* = *the Square of the Sum of your Departure involved to its Power, and Difference of Latitude; this will bring you to your deſired Port.*

[10] Queſt. 20. *by Mr.* Alexander Naughley.

A KNOT of mad Blades were drinking of Rounds,
VERNON's Health in a Horn of two Equal Go-downs;
The Content a Pint; five Inches the Height;
Diff'rence of Diameters, an Inch and four Eights:
When the *Peeper* came in, and needs he muſt try,
At once how to *gage* both by Mouth and by Eye;
But ſo many full Bumpers he got for his Pains,
Alas! for him (poor Soul) has quitte noddled his Brains;
Now from what is here given; pray, Sirs, make appear,
Some Point on the *Horn* as a fix'd Standard, where
He may tip his Fore-finger, whene'er he comes there:
For whene'er he comes to *gage* at that Houſe,
Some *Toper* ſtraight aſks him this new Way to *'bouze*;
Be pleas'd then, good Sirs! to ſave him from Scorn;
Put a Speck of his *Daub* to mark out the Horn.

We once more return Thanks to our kind Contributors, and hope for the Continuance of their Favours; aſſuring them, that we ſhall conſtantly avoid the leaſt degree of Partiality, making it our Endeavour to d to each all the Juſtice poſſible: but muſt deſire them, never to exceed the time limited in the Advertiſement for receiving the Letters. As alſo not to fail ſending Solutions along with their Letters, Poſt paid.

An Alphabetical Catalogue of the CONTRIBUTORS, &c.

		Ænigm. answer'd.	*Questions Answered.*	
A	Archibald	1		
	J. Arden	all	1. 3. 4. 5. 8.	
	George Allen	—	4. 5. 6.	
	William Aldridge	—	4. 8.	
B	John Bardekin	1. . 4	4. . 6 8 9	
	John Badder	[illegible]	all but 2. 7.	
	William Butcher	—	8. 9. 10.	
	Bluhynden	[illegible] 3. 4	5. 6.	
	Matthew Blackamore *	1. 2. 4	8. 9.	
C	William Chapple	[illegible]	7.	
	R. Cestriensis	[illegible]	—	♂ ♄ ♃
	William Cobb	—		
D	William Durant	[illegible]		
	J. Dewhurst	[illegible]	6.	
	Abraham Donn	[illegible]	5. —	Cal. Eclip.
	* Robert Berry	—		
G	Richard Goucher	all	8.	
	Joseph Granger	all	all but 7. 9.	
H	Robert Hall	—	[illegible] 3. 5. 8.	
	Richard Hancock	1. 3	[illegible] 6. 8. 9	
	Daniel Howard	1. 3. 4	[illegible] 5. 8. 9.	
I	George Ingman	all	all but [illegible]	
	John Jackson	1. 3	all	
K	William Kingstone	1. 3. 4.	[illegible] 6. 8	
L	Abraham Lord	all	all —	♃ Satell.
	Edward Linthwaite	all		
M	Thomas Marshall	—	1. 3. 4. 5. 6. 8.	
	John Mayer	all		
	Thomas Mather	all	all but 7.	
	Crocus Metallorum	—		
N	Alexander Naughley	3 4.	[illegible] 8.	
P	Thomas Peat	all	[illegible] 8.	
	Miss Prue	1. 3. 4.		
R	Robert Robinson	all	[illegible] 8 9. 10.	[illegible] all but
	John Reynolds	1. 3. 4		
	John Rubens	—		
	John Randles	—		
S	William Spicer	—	[illegible] 2.	
	Samuel Strother	—		
	Thomas Sandby	all		
T	William Taylor	all	4.	
	Anth. Thacker	—	[illegible] 8.	
	Walter Trott	1. 3.	4	
W	William Whitehead	all	all	
	Dionysius Williams	1. 3 4		
	George Witchell	—		

FINIS.